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Report No. 14

June 25, 1984

**An Archeological Overview and
Management Plan for the
Holston Army Ammunition Plant,
Hawkins and Sullivan Counties, Tennessee**

Under Contract CX-5000-3-0771
with the

**National Park Service
U.S. Department of the Interior**
Atlanta, Georgia 30303

for the
U.S. Army Materiel Development
and Readiness Command

by

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16. Abstract (Limit: 200 words) The Holston Army Ammunition Plant in Hawkins and Sullivan counties, northeastern Tennessee, is an installation of the U. S. Department of the Army's DARCOM command. As a steward of approximately 6500 acres of public land, the plant has responsibility for the management of any cultural resources located within it. No professional archeological inventory of the facility has been conducted. During the 1970s members of the Tennessee Archeological Society excavated 1-1.5 acres of a large prehistoric Woodland occupation site that had human burials within it; this site has never been analyzed and reported, and may still have some integrity. Other prehistoric sites are reported by local informants to exist in undisturbed portions of the Plant, and historic records indicate that some historic archeological resources may also exist there. Thus, this report recommends that a professional archeological inventory of a representative portion of the relatively undisturbed areas of the facility be conducted. In addition, the collected materials from site 40 HW 15 should be analyzed and reported, the site's present integrity evaluated, and any human remains from the site treated in accordance with federal guidelines.				
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MANAGEMENT SUMMARY

The Holston Army Ammunition Plant is a DARCOM facility (Department of the Army Materiel Development and Readiness Command), with responsibilities for the management of the prehistoric and historic archeological resources on its lands. This report is a summary of the cultural and environmental history of the area that provides a context for the interpretation and evaluation of facility archeological resources. It also provides an assessment of the total archeological resource base likely to exist on installation lands and recommendations for future management of these resources within the overall context of DARCOM missions, federal legislation, and public responsibilities.

The Holston AAP is located in the Holston River Valley of northeast Tennessee, in and immediately west of Kingsport. The plant contains slightly more than 6000 acres, divided into two non-contiguous parts: Area A, 45 acres within the city limits of Kingsport; and Area B, slightly more than 5955 acres lying three miles to the west, across Clouds Bend. The two areas are joined by an inter-plant railroad and pipelines. The AAP is a government-owned, contractor-operated (GOCO) facility under the jurisdiction of the Commander, U.S. Army Armament Materiel Readiness Command (ARRCOM, a DARCOM sub-command). It is operated by the Holston Defense Corporation (HDC), a wholly owned subsidiary of Eastman Kodak Company. The function of the facility is to manufacture, store, and package specialized explosives, and it also has an active program of leasing agricultural lands on the AAP.

No professional archeological inventory of the Holston AAP has been conducted. A single prehistoric site was salvage excavated by members of the Kingsport Chapter, Tennessee Archeological Society in the 1970s, but its materials and information have not been analyzed or reported. The site, which was originally several acres in extent, dates to the Woodland period, had included human burials, and is estimated to be 50 percent intact today. Local informants report that other prehistoric sites exist on the facility, and historic documents indicate that historic archeological materials may be retained there as well. It is estimated that up to 5500 acres of the facility have had no major ground disturbance other than plowing during the past 40 years, and that the plowed areas may still retain significant archeological resources.

Because important cultural resources may well be located on the Holston Army Ammunition Plant, and because DARCOM has mandated

responsibilities for the identification, evaluation, and protection of public land resources, the development of an installation Historic Preservation Plan is recommended as a long-term goal. Such a plan should be based on a field inventory of the archeological resources retained on the facility; an outline of the scope of work, milestones, and cost of such an inventory and evaluation program is presented in this report. In addition, it is recommended that DARCOM has a responsibility to support the professional description, evaluation, and reporting of materials derived in the past from site 40 HW 15; the appropriate treatment of any still-existing human skeletal remains from that site; and the immediate field evaluation of any remaining elements of that site. A scope of work, milestones, and broad estimate of costs for that recommendation is also provided.

PREPARERS AND QUALIFICATIONS

Charles H. McNutt is the principal author of this report. He holds a BS summa cum laude in Mathematics and an MA and PhD in Anthropology, with emphasis in archeology. He has participated in archeological excavations in many parts of North America during the past 30 years and has published approximately 50 articles, reviews, and reports. During the past 10 years he has concentrated on cultural resource studies in the southeastern United States. He is presently Professor of Anthropology at Memphis State University and Director of its Anthropological Research Center.

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Final report production, including graphics, has been completed by Woodward-Clyde Consultants, with editorial review (particularly of management recommendations) and text preparation completed by Dr. Ruthann Knudson, Ms. Betty Schmucker, and Mr. Charles McNutt Jr..

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FOREWORD

As a federal agency with large public land holdings, the U. S. Army is responsible for the stewardship of a variety of natural and cultural resources that are part of its installations' landscapes. The Army's Materiel Development and Readiness Command (DARCOM) presently manages a nationwide network of 65 installations and 101 subinstallations and separate units, which range in size from 1 acre to over 1 million acres. As part of its programs of environmental and property management, DARCOM has requested that the U.S. Department of the Interior's National Park Service provide technical guidance to develop programs for managing installation cultural resources.

NPS is thus conducting the DARCOM Historical/Archeological Survey (DHAS), which has two major disciplinary elements. The architectural review and planning function is being directed by the Service's Historic American Buildings Survey (HABS), while the prehistoric and historic archeological resource assessment and planning function is the responsibility of the Service's Interagency Resource Division (IRD). IRD has contracted with Woodward-Clyde Consultants (WCC) for the development of guidelines for the DARCOM archeological management planning effort, and for the completion of over 40 overviews and plans throughout the central United States. WCC has in turn subcontracted the technical studies to several regional subcontractors, with final editorial review of reports and preparation of text and illustrations handled by WCC.

This overview and recommended management plan for the archeological resources of the Holston Army Ammunition Plant was prepared by the Memphis State University, Memphis, under subcontract to WCC. It follows the guidance of "A Work Plan for the Development of Archeological Overviews and Management Plans for Selected U.S. Department of the Army DARCOM Facilities," prepared by Ruthann Knudson, David J. Fee, and Steven E. James as Report No. 1 under the WCC DARCOM contract. A complete list of DHAS project reports is available from the National Park Service, Washington, DC.

The DHAS program marks a significant threshold in American cultural resource management. It provides guidance that is nationally applicable, is appropriately directed to meeting DARCOM resource management needs within the context of the Army's military mission, and is developed in

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complement to state and regional preservation protection planning (the RP3 process, through State Historic Preservation Offices). All of us participating in this effort, particularly in the development of this report, are pleased to have had this opportunity. Woodward-Clyde Consultants appreciates the technical and contractual guidance provided by the National Park Service in this effort, from the Atlanta and Washington DC offices and also from other specialists in NPS regional offices in Philadelphia, Denver, and San Francisco.

Woodward-Clyde Consultants

Ruthann Knudson

The following report is an overview of and recommended management plan for the prehistoric and historic archeological resources that are presently known or likely to occur on the Holston Army Ammunition Plant (AAP) in Hawkins and Sullivan Counties, Tennessee (Figure 1-1). This facility is an installation of the U. S. Department of the Army DARCOM (Materiel Development and Readiness) Command, which as a reservation of public land has responsibilities for the stewardship of the cultural resources that are located on it. The assessments and recommendations reported here are part of a larger command-wide cultural resource management program (the DARCOM Historical/Archeological Survey, or DHAS), which is being conducted for DARCOM by the U. S. Department of the Interior's National Park Service. The following is that portion of the facility-specific survey that is focused on the prehistoric and historic resource base of the Holston AAP, and was developed in accordance with the Level B requirements as set forth in the archeological project Work Plan (Knudson, Fee, and James 1983). A companion architectural study is in preparation by NPS's Historic American Building Survey (HABS), but is not yet available (William Brenner, personal communication 1984).

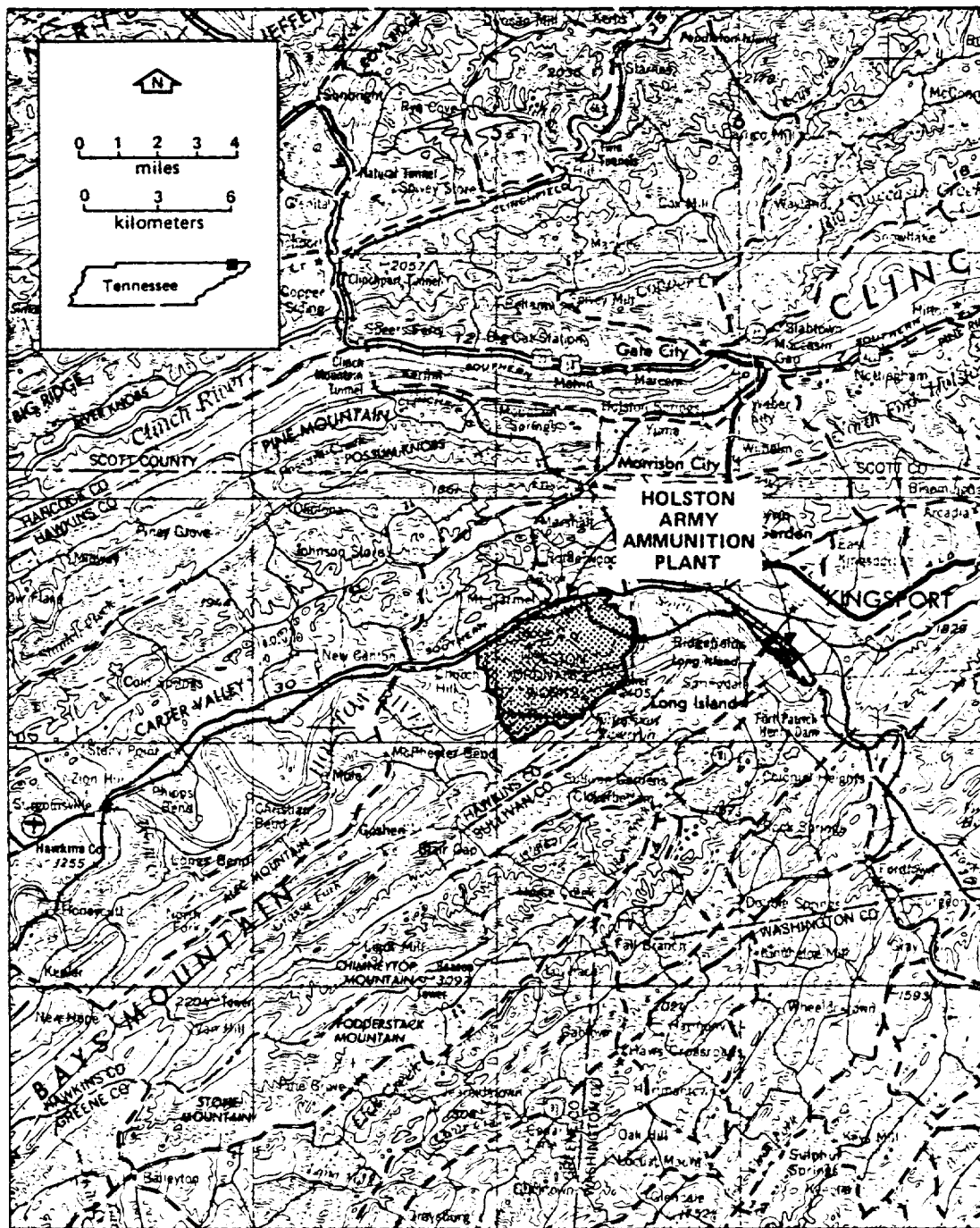
1.1 PURPOSE AND NEED

A corpus of Federal laws and regulations mandate cultural resources management on DARCOM facilities. Briefly these are:

- The National Historic Preservation Act of 1966 as amended (80 Stat. 915, 94 Stat. 2987; 16 USC 470), with requirements to,

inventory, evaluate, and where appropriate nominate to the National Register of Historic Places all archeological properties under agency ownership or control (Sec. 110(a)(2))

- prior to the approval of any ground-disturbing undertaking, take into account the project's effect on any National Register-listed or eligible property; afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed project (Sec. 106)
- complete an appropriate data recovery program on an eligible or listed National Register archeological site prior to its



Note: Base maps are the Church Hill, TN-VA 7.5' (1959) sheet, photorevised 1973, the Kingsport, TN-VA 7.5' (1959) sheet, photorevised 1978, and the Lovelace, TN 7.5' (1939) sheet, photorevised 1971.

Figure 1-1. MAP OF THE GENERAL VICINITY OF THE HOLSTON AAP

being heavily damaged or destroyed (Sec. 110(b), as reported by the House Committee on Interior and Insular Affairs [96th Congress, 2nd Session, House Report No. 96-1457, p. 36-37])

- Executive Order 11593 (36 FR 8921), whose requirements for inventory, evaluation, and nomination, and for the recovery of property information before site demolition, are codified in the 1980 amended National Historic Preservation Act
- The Archeological and Historic Preservation Act of 1974 (88 Stat. 174, 16 USC 469), which requires that notice of an agency project that will destroy a significant archeological site be provided to the Secretary of the Interior; either the Secretary or the notifying agency may support survey or data recovery programs to preserve the resource's information values
- The Archaeological Resources Protection Act of 1979 (93 Stat. 721, 16 USC 470aa; this supersedes the Antiquities Act of 1906 [93 Stat. 225, 16 USC 432-43]), with provisions that effectively mean that
 - The Secretary of the Army may issue excavation permits for archeological resources on DARCOM lands (Sec. 4)
 - No one can damage an archeological resource on DARCOM lands without a permit, or suffer criminal (Sec. 6) or civil penalties (Sec. 7)

In short these laws require that all archeological resources on DARCOM owned or controlled property are to be found, recorded, evaluated, and protected from damage or destruction without scientific recovery of the data preserved in them. This means that consideration of these resources must be included in the earliest stages of project planning in order to avoid unnecessary disruption and delays in project construction.

A variety of procedures have been developed to expedite compliance with the various aspects of these laws. Among the most important of these are:

- 36 CFR 600, "Protection of Historic and Cultural Properties" (44 FR 6068, as amended in May 1982); these regulations from the Advisory Council on Historic Preservation set forth procedures for compliance with Section 106 of the National Historic Preservation Act
- Department of the Interior procedures for determining site eligibility for the National Register of Historic Places (36 CFR 60, 36 CFR 63), and standards for data recovery (proposed 36 CFR 66)

- United States Department of the Army procedures and standards for preserving historic properties (32 CFR 650.181-650.193; Technical Manual 5-801-1; Technical Note 78-17; Army Regulation 420); and procedures for implementing the Archaeological Resources Protection Act (32 CFR 229).

Integration of the necessary procedures into basic facility operations and planning is needed to assure effective management of the various archeological resources on the property, and to minimize the risk of unanticipated project disruptions. This operational integration should include assuring awareness of the locations and need for preservation of the resources on the part of maintenance personnel as well as the engineering and planning staff in order to preclude damage from maintenance and groundskeeping activities. Over a period of time, a tree planted here, a drain line or sidewalk run there, and a bucket of "X" dumped somewhere else can destroy a site as effectively as a bulldozer and is a long-term hazard that may best be prevented by routine facility-level procedures.

1.2 THE HOLSTON AAP

The Holston Army Ammunition Plant (originally Holston Ordnance Works) was constructed during the early part of World War II to manufacture the super-explosive RDX. It continues its role in the manufacture of specialized explosives today.

As early as January 1941, the Tennessee Eastman Corporation in Kingsport had been concerned with laboratory and pilot plant development for the production of RDX. It was more than logical that the War Department locate its plant in the Kingsport area (Figure 1-1). In December 1941, it prepared its "Confidential Site Survey for an Ordnance Plant near Kingsport, Tennessee." (Englander [1946] is drawn on heavily in this section for historical background.)

Within the next five months, a second pilot plant was constructed, in this case to demonstrate that the Eastman process for production of "Composition B," a mixture of RDX and TNT, was amenable to large-scale production. Formal contracts were issued by the U. S. Army to Eastman and to architectural engineering firms in August 1942, calling for plant use by August 1943.

The simultaneous design, construction, and operation of the huge plant was truly a tribute to all agencies concerned. Construction was coordinated by Fraser-Bruce Engineering Company; operation was the responsibility of Tennessee Eastman Company, a division of Eastman Kodak Company. The first production actually occurred in May 1943; seven additional production lines were completed by July 1943. During the summer, additional contracts were issued to double the production already achieved. By January 1944, ten production lines were operating at 200 percent original capacity. Fifteen thousand people had been employed

during the construction process; five thousand were employed on a regular basis to operate the plant. Weekly payrolls reached \$3,000,000. Between February 1944 and August 1945, Holston Ordnance Plant became the largest high explosive plant in the world, producing approximately 1,500,000 pounds of material per day.

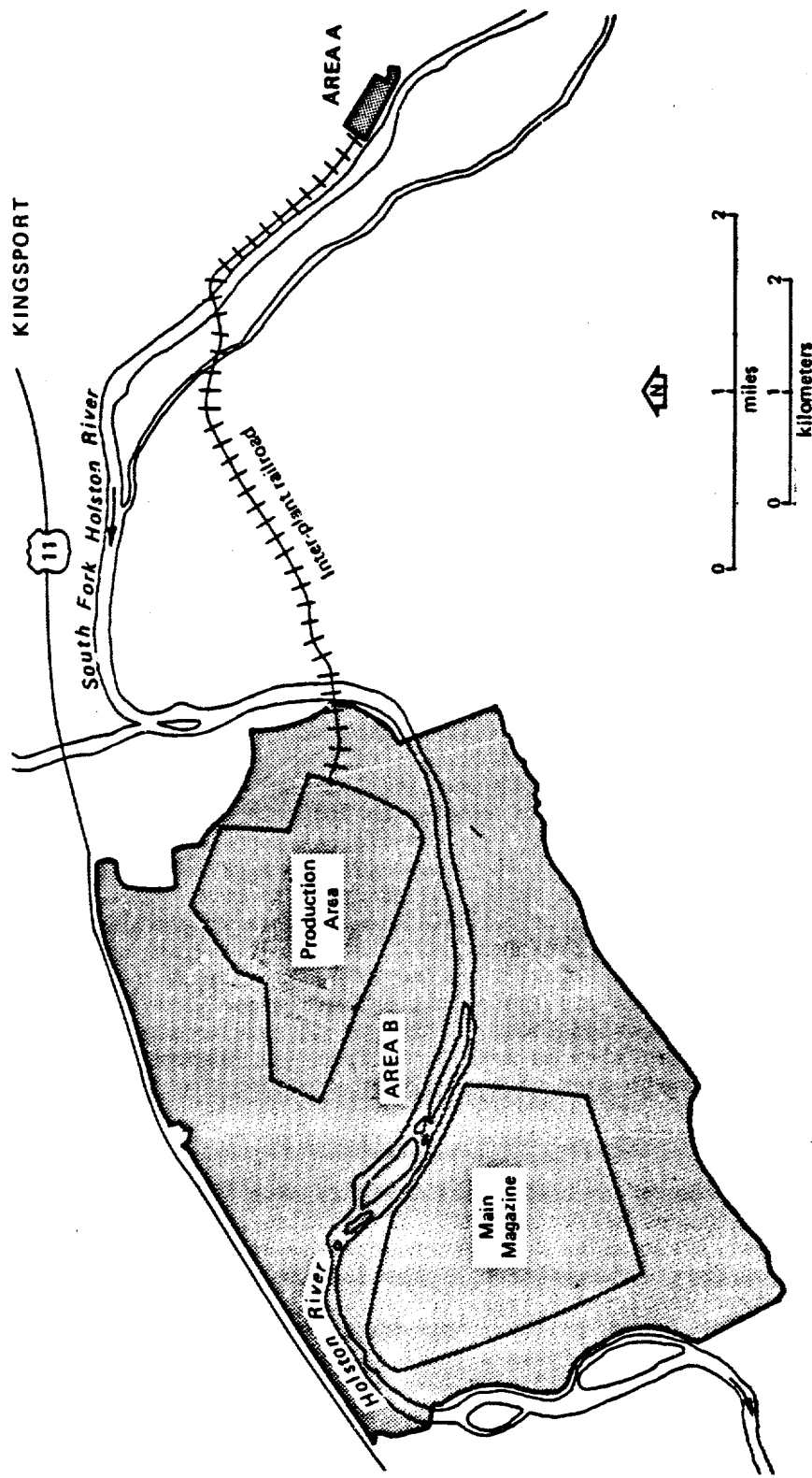
In August 1945, following the surrender of Japan, production ceased. The five thousand employees of the plant were suddenly out of work. Because of the carefully planned industrial development that characterizes the Kingsport area, most of these workers were absorbed into the labor force within a year.

The plant was maintained in standby status until April 1949. From that date, through Korea and Viet Nam, until the present (1983), the facility has been operated as the Holston AAP by the Holston Defense Corporation, a subsidiary of Eastman Kodak. Production lines were rehabilitated throughout the 1950s and 1960s. The mission of the plant has changed with the times however. It presently produces not only RDX and Composition B, but also a tremendous variety of specialized products for all armed forces, the Atomic Energy Commission, and National Atmospheric and Space Administration contractors. More than 70 different types of explosives were being produced as early as 1966 (Heglar 1978).

The basic structure of the plant (Figure 1-2) has remained remarkably stable during the past 40 years. It is divided into two main sectors. Area A (Figure 1-3), for the manufacture of glacial acetic acid and acetic anhydride, is a relatively small (45 acres) heavily developed area adjoining the Tennessee Eastman complex on Industry Drive, along the South Fork of the Holston River, in the city of Kingsport (Sullivan County). Area B (Figure 1-4), for the manufacture of explosives, purification of spent acetic acid, and storage, is much larger (6500 acres) and less intensively developed. Area B lies to the west (in Hawkins County), across Clouds Bend, and is separated from Area A by somewhat more than three miles. The two areas are joined by an inter-plant railroad and pipelines that carry the raw materials produced in Area A to the production lines in Area B. Access to the Administrative Center, also in Area B, is from U.S. Highway 11 W, 0.8 miles west of the North Fork of the Holston River.

1.3 SUMMARY OF PREVIOUS ARCHEOLOGICAL WORK CONDUCTED AT THE HOLSTON AAP

A minimal amount of archeological work has been done in the Kingsport area. A major, recent effort is that of the University of Alabama in Phipps Bend, eight air miles down river from the Holston AAP. In southeastern Kingsport, excavation of the Eastman Rockshelter (40 SL 34) has recently been completed by paraprofessionals, yielding Early Archaic and possibly Paleo-Indian cultural materials. Site 40 SL 10 on Long Island between Holston AAP Areas A and B and site 40 HW 11 two miles downriver from the Holston AAP have been excavated by the Kingsport Chapter, Tennessee Archaeological Society (TAS), but there are no



Note: Detailed maps of Area A and Area B are presented in Figures 1-3 and 1-4 respectively.

Figure 1-2. MASTER BASE MAP OF THE HOLSTON AAP

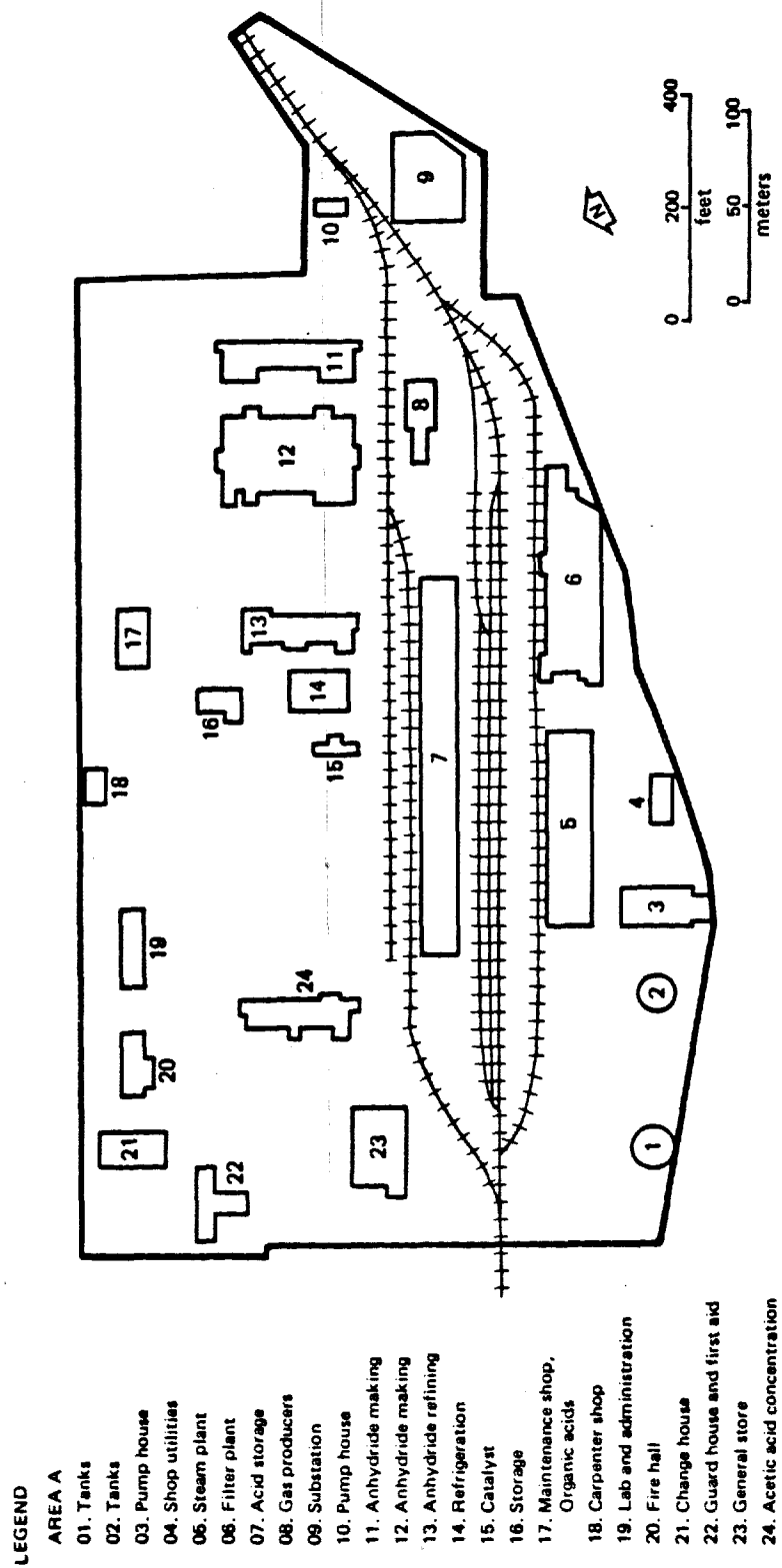


Figure 1-3. DETAILED BASE MAP OF THE HOLSTON AAP, AREA A

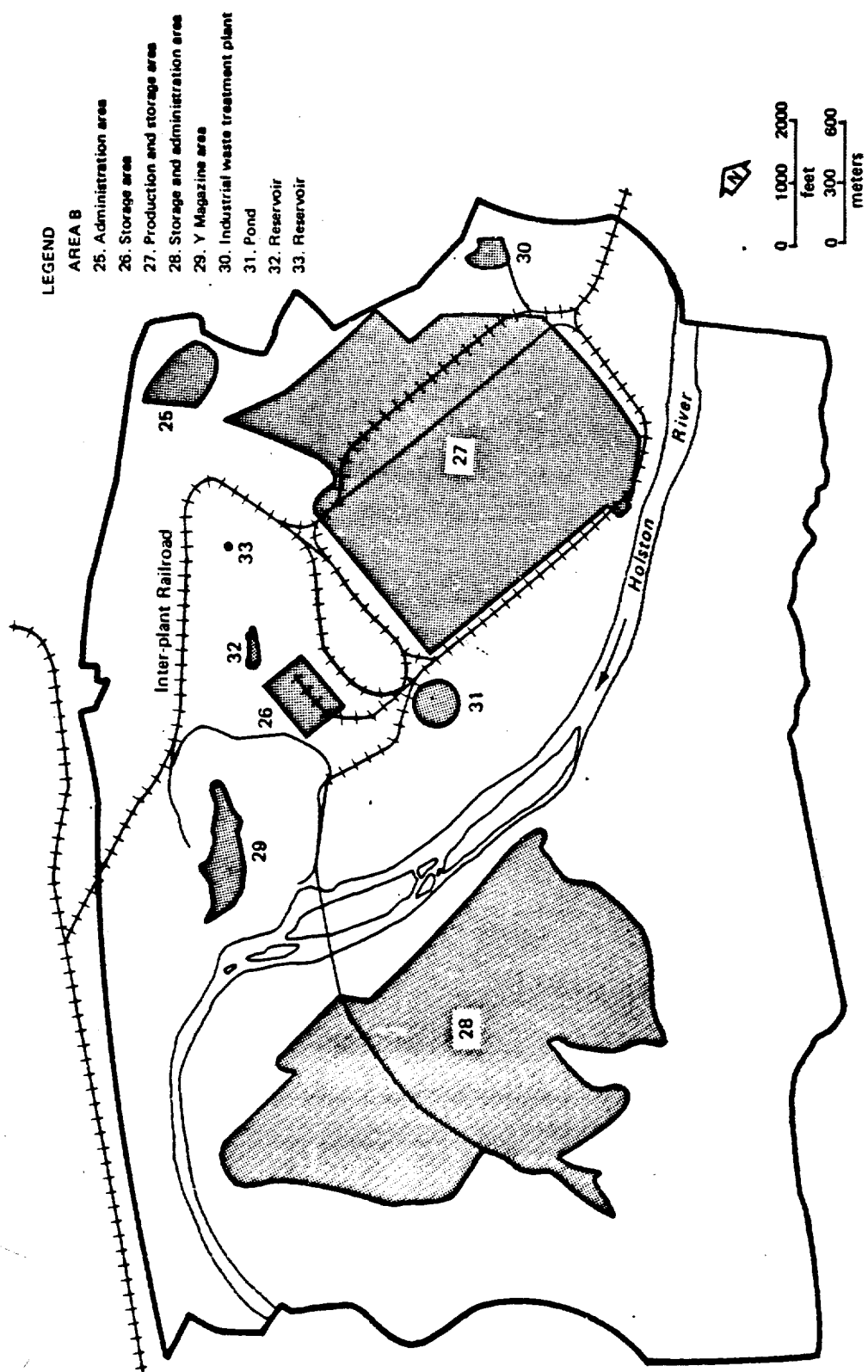


Figure 1-4. DETAILED BASE MAP OF THE HOLSTON AAP, AREA B

published reports of this work. These projects are discussed in more detail in Section 3.0. One shallow prehistoric site (40 HW 15) is known to be located on the AAP. It was also excavated by members of the Kingsport TAS Chapter; no report of the excavation has been published.

1.4 THE SOCIOCULTURAL CONTEXT OF ARCHEOLOGICAL RESOURCES ON THE HOLSTON AAP

Archeological resources are particularly valuable to archeologists and culture historians because of the information that only archeological sites can provide about the past human occupancy of an area. Such information is crucial for broad regional interpretations of prehistory. Ultimately, such studies of past human behavior may provide knowledge about the potentials and limitations for human behavior in the present. For example, lessons learned from studying prehistoric marginal farmers in the Kingsport area may be relevant to the study of other marginal farmers found throughout much of the world today.

There is also tremendous interest in archeological resources on the part of local enthusiasts, who range from highly competent amateur archeologists to people who simply collect antiquities for personal satisfaction or financial gain. During the past twenty years, there has also been a constantly increasing interest in archeological sites on the part of Native American Indians. These sites do, after all, embody their cultural heritage. Unfortunately, much of this interest has been aroused in a climate of confrontation. Excavations of late prehistoric and early historic Indian sites have resulted in the disturbance of graves of individuals with known ethnic affiliations and the destruction of places which are regarded as sacred by existing Indians. The native Indian groups involved are as concerned with such destruction as are Europeans when family cemeteries are inadvertently incorporated as fill dirt in a construction project, and for precisely the same reasons. It is virtually impossible, on the other hand, to assign contemporary ethnic identity to any archeological site that is more than 1000 years old, and the legitimate sentimental value of such sites has been the subject of heated discussion. The point remains, however, that local prehistoric sites do have relevance to the general native American heritage and this heritage has become an extremely important concern in recent years.

Finally, it should be noted that many agencies have found that archeological resources, properly exploited, can be of value in public relations. By facilitating archaeological preservation or financing proper excavation and (most importantly) publication of investigations, agencies can establish and maintain the good-will of both local groups and larger interest groups.

AN OVERVIEW OF THE CULTURAL AND RELEVANT
NATURAL HISTORY OF THE HOLSTON AAP

2.1 THE PHYSICAL ENVIRONMENT

2.1.1. Earth Resources

The Holston AAP is located in the Great Valley, a part of the southern section of the Ridge and Valley Physiographic Province as defined by Fenneman (1938:195-278). The area is characterized by long narrow valleys separated by longitudinal mountains and ridges running north and south. The western border of the Appalachian Plateau Physiographic Province, represented by the Unaka Mountains, is located approximately 30 miles to the east of the AAP.

The complex topography of the Holston AAP is largely the result of thrust faulting and folding, with subsequent erosion of the softer clastic stratum. There are five major topographic zones within the facility boundary: the floodplain and islands of the Holston River; alluvial terrace formations in the bends of the river; two ridge systems in the northern portion of Area B; and the slopes of Holston River Mountain.

The Holston River flows on the southern border of Area A and through Area B, separating Area B into northern and southern portions (Figures 1-1, 1-2). The river is bordered by floodplain and backswamp deposits of Staser silt loam, which extend a maximum of 1/4 mile inland on both sides of the river (Moore et al. 1979:43). Between River Mile 137.5 and 139 the Holston widens to accommodate eight small islands, known collectively as the Clay Islands. The Inter-Plant Railroad, which connects Areas A and B, crosses a portion of Long Island, situated south of Area A between River Miles 143.3 and 147.5.

Old high river terraces composed primarily of Holston loam cover a large portion of the bend north of the Holston River in Area B and most of Solitude Bend at the foot of Holston River Mountain in the southern half of Area B. Lower, more recent, alluvial terraces of Altavia and Statler silt loams are found parallel to the floodplain north of the river in Area B. A large portion of the terrace deposits in Area B and all of those in Area A were leveled during construction of the facility. In some spots, deep cutting has exposed underlying calcareous shale bedrock (Moore et al. 1979:32).

Holston River Mountain is situated in the southern portion of Area B. Elevations range from 1140 feet AMSL at the Holston River to 2300 feet AMSL along the mountain crest, which forms the facility's southern boundary. The steep northern slope consists of calcareous Sevier shale, with thin layers of limestone, siltstone, sandstone, and conglomerate of the Ordovician-aged Chickamauga group. Dandridge shaly silty clay loam covers most of the steeper slopes, with Jefferson cobbly loam on benches, footslopes and fans. On the crest and eastern slopes of the mountain, light-gray to white sandstone outcrops of the Bays Formation are exposed. Soils on this side of the mountain consist of Lebew Channery loam, Hartsells loam, and Jefferson cobbly loam (Hardeman 1966; Moore et al. 1979).

Two parallel ridge systems are found in the extreme northern portion of Area B. Highway 11W, which serves as the northern boundary of the facility, follows the first of these ridges. This northernmost ridge, with peaks reaching 1380 feet AMSL, is composed of cherty limestones and dolomites of the Knox group (Hardeman 1966). Much of the surface, especially in the western portion, is karst terrain. Hill tops and slopes are mantled with Dewey, Talbott, and Dunmore silt loam, or Clarksville cherty silt loam. Small patches of Etowah, Emory, and Minvale silt loams occur on benches, footslopes and fans (Moore et al. 1979).

The second ridge, just south of and parallel to the limestone ridge, consists primarily of Sevier shale overlying Knox limestone (Hardeman 1966). Elevations range from 1200 feet AMSL at the base to crests at 1400 feet AMSL. Soils are primarily Dandridge shaly silt loam, with small areas of Sequoia and Needmore silt loam and Nella cobbly loam.

The preceding discussion of local geology, soils, and landforms is important in predicting possible prehistoric and historic site locations, settlement patterns, and available natural resources within the Holston AAP boundary. For instance, the limestone ridge in Area B is likely to harbor habitable caves and rock shelters. The Knox limestones are also a source for dark gray chert, or flint, used in the production of stone tools. Sinkholes and limestone depressions are often sites for early aboriginal occupations and chert extraction. Small, seasonally occupied hunting and gathering sites on upland benches, ridge spurs, and rock shelters can be expected on the rugged slopes of Holston River Mountain. Larger habitation sites and farmsteads are more likely to be found along the alluvial terrace deposits, with seasonal occupation in the floodplain.

2.1.2 Water Resources

An abundant supply of fresh water is available year round within the facility area. The North Fork and South Fork of the Holston River come together near River Mile 142, approximately four miles downstream from AAP Area A and 1.2 mile north of Area B. Tennessee Valley Authority construction of Fort Patrick Henry Dam, located approximately four river miles upstream from Area A, has eliminated most flooding problems.

AAP Area A is located at the confluence of Mad Branch, which drains a large section of central Kingsport, and the South Fork of the Holston River. Arnott Branch, several smaller unnamed streams, and six drainage ditches drain the northern portion of Area B. The major named streams in the southern portion of Area B are Sand Branch and Parker Creek, with numerous smaller streams cascading down the northern face of Holston River Mountain. A small area along the southern boundary of Area B drains down the eastern face of the mountain into Laurel Run, which empties into the Holston River south of the facility. These are all perennial water resources.

2.1.3 Modern Climate

Temperatures in the vicinity of the Holston AAP vary according to elevation as well as season. Locations in the river valley are generally very cool in the winter, with occasional warm spells. Summers are very warm and frequently hot. Mountain tops and upper slopes are generally cold in the winter. In summer, upper elevations are warm during the day, becoming cool at night.

The climate is largely determined by warm, moist air masses from the Gulf of Mexico, and cool, dry continental air masses from the north and west. The prevailing winds are from the west-southwest, with an average windspeed of approximately six miles per hour (Moore et al. 1979: 2-3).

Temperatures recorded in Rogersville (25 mi. downriver from the AAP) between 1931 and 1970 show an average temperature of 58° F, with an average daily minimum of 45° F and average daily maximum of 70° F. The winter average daily minimum is near 29° F. Approximately two-thirds of the days in winter have temperatures of 32° F or less, although only about one day a year has temperatures below 0° F. Summer temperatures average 87° F for the daily maximum, with an average daily minimum of 63° F. The highest temperature recorded in Rogersville is 104° F--the lowest is -19° F. The average growing season is 190 days, usually between mid-April and late October (Moore et al. 1979:2-3).

Precipitation is abundant and generally well distributed throughout the year. It is heaviest in winter and spring and usually lightest in summer and early fall. Average yearly precipitation is 44.3 inches. The lowest total rainfall was recorded at 29.3 inches in 1941, the highest being 53.0 inches in 1948 and 1962. Severe storms are rare. Snowfall is infrequent, with an average of 6.1 days a year with snowcover. Yearly accumulations of snow average 3.5 inches (Moore et al. 1979:2-3).

2.1.4 Plant Resources

The varied topographic, microclimatic, and edaphic characteristics of the facility area provided past inhabitants a diversified mosaic of vegetational communities. The river valleys of upper East Tennessee are among the richest and best suited areas for aboriginal hunting and gathering in the southeastern United States.

The study area is situated in the Ridge and Valley section of the Oak-Chestnut Forest as defined by Braun (1950:225-242). Upland slopes and mountain tops were originally covered with forests predominated by oaks and American chestnut. Hemlock and mixed mesophytic communities occur locally. On the valley floor and low shale and limestone ridges, white oak predominates, accompanied by tuliptree, hickory, red oak, and black oak. Red cedar is often found on rocky limestone karst terrain. Small areas of mixed mesophytic species, such as basswood, sugar maple, tuliptree, and beech are found along well watered entrenched stream beds.

Chestnut, black walnut, hickory, beech, and some species of oak would have been especially important as food sources. Food-producing herbaceous and woody plants on the forest understory and floor include paw-paw, persimmon, black cherry, huckleberry, service-berry, wild plum, mayapple, blackberry, raspberry and strawberry. Herbaceous food resources probably available in the floodplain zone include scuppernong grapes, water smartweed, giant ragweed, lamb's quarter, Jerusalem artichoke, dock, goosegrass, duck potatoes, and common cattail, to mention a few (Faulkner and McCollough 1973:8-34).

2.1.5 Animal Resources

Animal resources, like native floral resources, were once numerous and diverse. Important food species include the white-tailed deer, black bear, racoon, opossum, cottontail rabbit, squirrel, turkey, and passenger pigeon. Occasional woodland bison and elk were also probably taken by the skilled prehistoric or historic hunter. The streams and river provided an abundance of fish, as well as turtles, amphibians, mollusks, aquatic birds, and aquatic mammals (Heglar 1978).

2.1.6 Paleoenvironment

Paleoenvironmental research in the southern Appalachian area has provided evidence of dramatic climatic and ecologic change over the last 40,000 years. One important site--Shady Valley Bog--is located east of the Holston AAP in Johnson County, Tennessee (Barclay 1957).

Delcourt and Delcourt (1981), using radio-carbon dated pollen from 100 localities in the eastern United States and Canada, have constructed paleovegetational maps spanning the past 40,000 years. Inferred climatic and vegetational changes for the facility area are presented in Table 2-1. Generally, conditions were cooler and wetter during the Terminal Pleistocene (40,000-12,500 years ago), gradually becoming warmer and drier than today during the Mid-Holocene (8000-4000 years ago), followed by increased precipitation and cooling weather to present conditions. Thus, climatic conditions have ranged from those comparable to modern central Canada to those of areas south of the facility area. Successive climatic conditions and associated forest compositions usually support quite different numbers and species of animals, thus providing significantly different sets of subsistence resources for human populations present.

Table 2-1. SUMMARY OF THE ENVIRONMENTAL HISTORY OF THE AREA OF THE HOLSTON RAP (AFTER DELCOURT AND DELCOURT 1981)

Date	Geological Epoch	Geological Subage	Geological Interval	Inferred Climate	Inferred Forest Composition
4000 BP - Present			Late-Holocene Interval	Slight cooling trend with increased precipitation	Oak-chestnut forests predominate on mountainous slopes; relict "islands" of spruce and fir at higher elevations; white oak predominates on valley floor, with small areas of mixed mesophytic forests along entrenched streams
4000 - 8000 BP	Holocene		Mid-Holocene Interval	Increased warmth and aridity; ice sheets and sea level near present position by 5,000 BP	Oak-chestnut forests become dominant in the Central and Southern Appalachians; species-rich mixed mesophytic forests restricted to the Cumberland Plateau; spruce and fir at higher elevations
8000 - 12,500 BP			Early-Holocene Interval	Major warming trend; Laurentide ice sheet retreats north of Great Lakes region	Mixed hardwood forests of oak, maple, beech, basswood, elm, walnut, hemlock, gum; relict "islands" of spruce and fir persist at higher elevations
12,500 - 16,500 BP			Late-Glacial Interval	Mild warming trend; Laurentide ice sheet retreats north; surge of melt water	Boreal forest dominated by jack pine with subdominates of spruce and fir; spruce-jack pine forests to the west; alpine tundra on Appalachian summits
16,500 - 23,000 BP		Woodfordian	Full Glacial Interval	Peak of glacial condition; ice sheets extend south to Ohio River; sea level approx. 100 meters lower than today	Boreal forest dominated by jack pine with subdominates of spruce and fir; deciduous species possibly in south-facing gorges and slopes; alpine tundra along crest of Great Smoky Mountains
23,000 - 28,000 BP	Terminal Pleistocene (Wisconsin Glacial Advance)	Farmdalean		Mild warming trend; minor retreat of ice sheet; ten-fifteen meter rise in sea level	Boreal forest dominated by jack pine with subdominates of spruce and fir
28,000 - 40,000 BP		Late Altonian		Cool and moist; Laurentide ice sheet extends south into Great Lakes region	Boreal forest dominated by jack pine with subdominates of spruce and fir

* BP - Years Before Present (AD 1950 baseline).

2.2 THE CULTURAL ENVIRONMENT

2.2.1 Prehistory

The general prehistoric culture sequence for the southeastern United States is usually presented in terms of four major stages or traditions of cultural development: Paleo-Indian, Archaic, Woodland, and Mississippian.

The Paleo-Indian tradition covers the initial occupation of the area by wide-ranging bands of migratory hunters. Beginning perhaps as early as 20-30,000 years ago, the Paleo-Indian period lasted until 7000 BC, by which time the last ice sheets of the final glaciation had retreated from the northeastern United States. Sites dating from this time period are rare and usually marked by very few remains.

During the Archaic stage, there is evidence of decreasing nomadism, as people became familiar with the various wild plants and animals of their particular local regions. These were times of restricted mobility, increased cultural differentiation, and slow but steady population growth. This period ends with moderately stable populations and finally the introduction of pottery.

Pottery is soon followed by early experiments with plant domestication and ever-increasing evidence of semi-permanent villages. Village sites are marked primarily by broken and discarded pottery, the hallmark of the Woodland tradition. Although the importance of gardening grew steadily, the bountiful wild plants and animals of the Southeast continued to provide the staple foods. Increasing concern with burial ceremonialism, culminating in the construction of dome-shaped earthen mounds over interments of individuals of obvious social status, characterized much of the period and reached its zenith in the middle Woodland stage. Following several centuries of retrenchment and the decline of burial ceremonialism in late Woodland times, the final stage of the sequence begins.

At roughly AD 1000, the fully agricultural Mississippian stage begins. Characterized by densely populated villages which often contained a central plaza and one or more temples atop flat pyramidal earthen mounds, the Mississippian marks the climax of cultural development north of Mexico. It was this type of culture which was encountered and soon destroyed by the early European explorers and settlers of the sixteenth and seventeenth centuries.

These major stages are represented very unevenly in the Kingsport and immediately adjacent areas. A brief overview of our very sketchy knowledge of these local manifestations is given in the following paragraphs. Details of settlement location, subsistence, and specific archeological remains are summarized in Table 2-2.

The date for human arrival in the New World is uncertain. There is increasing evidence of archeological sites in Mexico and South America by

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Table 2-2. SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE HOLSTON AAP

Cultural Unit				Kinds of Archeological Remains Representative of Period	
Tradition	Period or Phase	Date	General Settlement Patterns	General Subsistence Systems	
Industrial and Energy Development					
Industrial	AD 1930 to Present		Well planned industrial city; commercial district center, with professional services; wholesale businesses and service industries surrounded by urban development south and east of Holston River; farms in outlying areas	Industrial output provides monetary means for purchase of foodstuffs; fruit and vegetable production provide fresh food in season	Remains of houses, barns, outbuildings and business foundations, ceramics, glassware, plastic articles and containers, articles made of rubber, Anglo-American goods, foreign import goods, auto parts, farm implements and machinery parts, bricks, tile, mortar fragments, window glass
Industrial Growth	AD 1895 to 1930		Rich mineral resources, progression of industries; settlement primarily along Holston River and Reedy Creek; population growth in larger towns near depot, major highways and shipping centers, and near industries; farmsteads located between towns in fertile valleys with one-room schoolhouses and small churches as the core of communities	Agriculture, some livestock farming, production of staple products, importation of needed products	Farm implements and machinery, barbed wire, cartridge cases, ceramics, iron cookware, tin products, telephone wire insulators, radion and radio parts, domesticated animal bone fragments, electrical light fixtures, brick, stoves (wood and gas), and coins
Civil War and Reconstruction	AD 1861 to 1894		Industry and shipping slack during this period; population fluctuates little	Agriculture, some livestock farming, limited trading and hunting; most food grown for household consumption	Farm implements, square nails, civil war artifacts, glass, house and mill foundations, metal materials, barrel hoops, iron and metal cookware, ceramics, nails, brick fragments
Early Industry and Shipping	AD 1800 to 1861		Development of iron industry, powder mills, tanneries, grist and saw mills, cotton mills attracted settlers. Shipping center at confluence of North and South Forks of Holston River, head of navigation of East Tennessee added incentive for settlement; outlying farmsteads near protective ports with few isolated cabins belonging to trappers and hunters	Progressive agriculture and industry, staple crops grown, livestock; shipping and trading of foodstuffs; hunting and trapping added to vegetable and domesticated animal fare	Ceramics, glass, animal bone fragments, cemetery burials, house and mill and storeroom foundations, wagon, harness and saddle parts, coal debris, hearth and cistern ruins, square nails, buttons, muzzle loading rifle parts, muskets and minie balls

Table 2-2. SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE HOLSTON RMP (continued)

Cultural Unit				Kind of Archeological Remains Representative of Period	
Tradition	Period or Phase	Date	General Settlement Patterns	General Subsistence Systems	
Frontier	Early Historic	AD 1761 to 1799	Settlement generally sparse, clustering around forts and general merchandising and trading posts; introduction of iron furnace, mills and tanneries provide livelihood for some; for others, the shipping on the Holston allows quick transport of furs, salt and iron ore; settlement around areas of mercantile activities	Agricultural products, livestock, poultry and dairy products, trade and shipping provide exchange for needed foodstuffs; hunting and fishing	Brass drawer pulls, pecker and silver cutlery, jewelry, pocket knives, mirror fragments, iron farm implements, metal candlestick holders, betty lumps, belly stove artifacts, animal and human bone, remains of flintlock rifle and bark-and-log house foundations, stone weapons and farming implements
	Ethno-Historic/Proto-Historic	AD 1673 to 1761	Palisaded villages (rare), clusters of Indian and European cabins along streams and rivers	Some aboriginal crops in bottom-lands; hunting, gathering, and fishing probably provided majority of food	Aboriginal remains not well-defined in area; remains of villages and cabins, European trade goods and occasional frontier domestic and hunting artifacts
Mississippian	Late Mississippian	AD 1350 to 1700	Presumably agricultural villages and/or hamlets; platform mounds not reported from immediate area, but exist to south and west	Presumably corn, beans, squash supplemented by gathered plants and hunted game	Dallas ceramics, small triangular projectile points; no domestic architecture or burials reported for immediate area; platform mounds, rectangular "large-log" domiciles, flexed and semi-flexed burials expected; Lick Creek and possibly possibly Citico style shell gorgets
	Early Mississippian	AD 1200 to 1350	Data poor, presumably horticultural villages; emphasis on bottomland locations, gathering and hunting locations probably existed on upper terraces	Presumably corn, beans, squash supplemented by hunted and gathered plants and game	Plagueh (Cobb Island) ceramic series, small triangular projectile points; little additional data from immediate area; rectangular domiciles with individually set wall-posts and central hearths reported from adjacent regions
Woodland	Late Woodland (Hamilton Phase)	AD 600 to 1200	Transitory occupations found primarily on upper terraces; seasonal gathering camps, hunting stations	Data very poor; some apparent emphasis on hickory nuts	Hamilton ceramics series (plain, cord-marked), some sand-tempered (Conestee?) ceramics; small, triangular projectile points; pits with burned rock, possibly earth ovens; no domestic architecture or burials known

Table 2-2. SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE HOLSTON AAP (continued)

Cultural Unit						Kinds of Archeological Remains Representative of Period
Tradition	Period or Phase	Date	General Settlement Patterns	General Subsistence Systems		
Woodland	Middle Woodland	AD 1 to 600	No data	No data; presumably gathering and hunting	Information very sparse; this period is postulated on the basis of the presence of what appear to be Middle Woodland burial mounds in the Kings- port area and adjacent areas; it is premature at present to specify a typical Middle Woodland assemblage for the area	
Early Woodland III (Long Branch Phase)	600 BC to AD 1	Lowland camps (seasonal) and upland hunting sites; sites located along streams in positions facilitating maximal exploita- tion of natural resources; re- occupation or continuous occu- pation of earlier sites suggests settlement continuity	Gathering and hunting of large and small mammals, turkeys; little evidence for use of aquatic foods (gastropods, pelecypods); with this exception, have picture of total use of environment	Long Branch fabric impressed pottery (local variety) and triangular (McFarland Cluster) projectile points predominant; Swannanoa series pottery and stemmed points (Ebenezzer and Upper Valley Cluster) present as minority forms; deep storage pits, pits with burned rock; no definite domestic architecture; burials flexed in circular pits, one example of extended burial; utilitarian objects and large sherds included with burials; elaborate grave goods known to occur during this period to south of project area, but such sites are atypical		
Early Woodland II (Phlips Phase)	700 to 600 BC	Lowland camps (seasonal) and upland hunting sites; sites located along streams in posi- tions facilitating maximal exploitation of natural resources; reoccupation of earlier sites suggests settlement continuity	Gathering and hunting of large animals (deer, elk), turkey, and aquatic species (gastropods, pelecypods) particularly important; more use of small mammals than in earlier periods	Local Swannanoa ceramics with in- troduction of Long Branch fabric impressed (limestone tempered); Upper Valley, Ebenezer, and McFarland (triangular) projectile clusters; deep pits, often containing burned rock; no domestic architecture; burials flexed in circular pits; minimal utilitarian objects included with burials		
Woodland	Early Woodland I (Swannanoa Phase)	1000 to 700 BC	Lowland camps (seasonal) and up- land hunting sites; sites located along streams in positions facili- tating maximal exploitation of natural resources	Gathering and hunting of large animals (deer, elk), turkey, and aquatic species (gastropods, pelecypods) particularly important	Local Swannanoa ceramics, relatively thin, well-made pottery with quartz- ite and micaceous sand temper, typically cord-marked; Upper Valley, Ebenezzer cluster, stemmed projec- tiles; deep pits, often containing burned rock; no domestic architec- ture or burials known	

Table 2-2. SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE WOLSTON AAP (concluded)

Cultural Unit		Period or Phase	Date	General Settlement Patterns	General Subsistence Systems	Kinds of Archeological Remains Representative of Period
Tradition						
Archaic	Late Archaic	4500 to 1000 BC	No firm data; minimal evidence for population increase; scattered deposits suggesting temporary, seasonal camps	Presumably gathering and hunting		Shoemaker (Late Morrow Mountain) and elongate, stemmed points (Pilot Creek) will pertain to this period, but also occur in Early Woodland period; hearths reported, but no residential architecture in literature; one burial reported, apparently flexed
	Early/Middle Archaic	7000 to 4500 BC	Very poorly represented, no reliable data; some occupancy of Council Bluffs Shelter Rock during this period; presumably seasonally occupied open sites also exist	Data poor; presumably gathering and hunting		Isolated points in local collections include Plevna, Kirk, St. Albans, and Morrow Mountain; this period appears to be poorly represented in the study area
Paleo-Indian	Eastern Fluted Point Period	12,000 to 7000 BC	Occasional fluted points found, primarily eroding out of banks of modern reservoirs; other isolated finds at higher elevations; hunting and butchering stations; no local concentrations of note; no firm evidence of shelter/cave occupancy strictly within this period; one fluted point found in Council Bluffs Rock Shelter. Basal Levels	Gathering and hunting, presumably deer, other large and small game; no evidence of Pleistocene megafauna kills; data very poor		Fluted and perhaps unfluted lanceolate points (Clovis, Cumberland), snub-nosed end scrapers with graver spurs; perhaps worked unifacial blades similar to those of Tennessee River area, but not reported; no known architecture or burials; no data on presence of Dalton groups

a Deas 1983: Personal communication.

at least 20-30,000 years ago (Bryan 1978; MacNeish 1976). There is little reason to doubt that people had also reached the Southeast by this time. (This assertion cannot be proved, however.) At such an early date, we can expect sites to be marked by sparse collections of rather crude stone tools appropriate to transient hunters and gatherers, and little else. Because stone projectile points (spear and arrow tips) have not been found from this early time, this vague and poorly defined period is referred to as "pre-projectile." There is no local candidate for a pre-projectile horizon in the Kingsport area and it may well be that, although people might have been in the vicinity before 11,000 years ago, they had not yet penetrated to the headwaters of the Holston at this time.

The earliest well documented projectile point in North America is the Clovis point, named for a site in New Mexico where it was found in direct association with bones of mammoth and other, now extinct, Pleistocene fauna. These point forms, characterized by basal flakes or "flutes" removed from both faces of an elongate blade, can be duplicated throughout the Tennessee Valley, although the associated faunal evidence cannot. In any event, comparable antiquity (10,000-12,000 BC) must be accorded the eastern fluted point specimens. In the Kingsport area, Clovis and presumably somewhat later Cumberland Fluted points have been reported eroding out of the banks of contemporary reservoirs, as isolated finds in the basal levels of rockshelters, and as isolated finds from higher elevations (Burbage 1962; Dean 1983: personal communication; Lewis and Kneberg 1961, 1962, 1964, 1965). In at least one case, snub-nosed end scrapers and retouched blades, also typical of this period, have been reported (Burbage 1962). These finds are generally isolated; no intact occupation from this period has been discovered as yet. The subsequent Dalton period, frequently regarded as a transitional phase between Paleo-Indian and Early Archaic, does not seem to be represented in our area, and it may well be that the Clovis and Cumberland tool types persisted in the upper Holston for some time.

Although data are very poor for the early and middle parts of the Archaic sequence, isolated finds (e.g., Piper and Piper 1979) and information from the recently excavated Eastman Rockshelter (40 SL 34) bridge (Dean 1983: personal communication) indicate that the area was probably sparsely occupied, presumably by small, highly mobile gathering and hunting bands which differed little in their lifeways from their predecessors in the area. McIlhany (1978) reports a fair showing of Early and Middle Archaic from the middle Nolichucky (some 40-50 miles south of the AAP), with sites divided about evenly between bottom lands and upper terraces. We can anticipate a comparable situation on the Holston AAP. Not until the Late Archaic, beginning perhaps 4500 BC, is there definite evidence in the literature of true Archaic sites in the Kingsport area. Available radiocarbon dates from the Eastman Rockshelter (Faulkner 1983) suggest that even this site, with typologically earlier materials, may date to this Late Archaic period. From Phipps Bend, some 15 airmiles downstream from Kingsport, scattered deposits (apparently including storage pits and a single burial) suggest temporary camps on

the upper terraces during this period (Lafferty 1981). The feeling remains, however, that occupation of the area throughout the Archaic is quite minimal, in contrast to the rather intensive Archaic occupations along the Tennessee River below Chattanooga (200 miles downriver from the AAP).

If the Archaic tradition makes a somewhat disappointing showing in the Kingsport area, the early Woodland tradition verges on the spectacular. Our information is derived primarily from Lafferty's (1978, 1981) excavations at Phipps Bend, though Early Woodland materials have been collected from 40 HW 14 in Smith Bend (River Mile 135.5) (Figure A-1) and 40 SL 10 on Cloud's Bend (Figure A-3) in the late 1960s (Froeschauer, personal communication 1983). Here some of the earliest pottery in Tennessee occurs, classed as a local version of the Appalachian Summit Swannanoa series (Keel 1976). Apparently people with a well developed ceramic tradition moved into the area from the north at approximately 1000 BC. Small camps are reported from both the lowlands and upper terraces at Phipps Bend. The picture conveyed is one of small groups of seasonally mobile people, exploiting the larger game animals of the forest edge and local mussel beds in the river. Storage and cooking pits have been found, but we have no knowledge of domestic architecture. As the early Woodland occupation progressed through the subsequent Phipps and Long Branch phases, exploitation of native resources apparently became more complete, as small game animal remains are found more frequently. During the Long Branch phase (600 BC-AD 1), the use of mussels apparently decreased, reflecting either a minor change in climate (wetter) or perhaps a change in the seasonal round. A new ceramic tradition of vessels made with clay having crushed limestone temper or grog and bearing fabric impressions on their surfaces appeared. This Long Branch ceramic tradition is one of the most widely spread in the eastern United States; its occurrence in the Kingsport area is extremely early. Although a terminal date of 400 BC is postulated for the Long Branch phase in Phipps Bend (Lafferty 1981), there is evidence from the Camp Creek site to the south (Lewis and Kneberg 1957) that it may have lasted until approximately the time of Christ in upper east Tennessee.

Following the burst of activity in the early part of the Woodland sequence, subsequent developments in the Kingsport area are extremely difficult to trace. In many parts of the Southeast, both to the north and south of Kingsport, there is considerable evidence of wide-ranging trade, an increase in burial ceremonialism, and the construction of burial mounds. The Rankin site (Smith and Hodges 1968), near the confluence of the Nolichucky and French Broad rivers (60-70 air miles southeast of the AAP), is of particular interest. Lacking burial mounds, it seems to stand on the border between Early and Middle Woodland. Elaborate burial assemblages evincing influence from the north were recovered. This is an unusual site; generally there seem to be only minimal developments in the area (McIlhenny 1978). Burial mounds did indeed exist in the Kingsport area; they were the object of some of the earliest professional excavations in the region (Thomas 1894). Although

it is difficult to evaluate these early excavations with precision, the presence of mica, steatite, and copper in them all suggest at least minimal participation in Middle Woodland burial ceremonialism.

The Late Woodland period in east Tennessee is characterized as the Hamilton phase. Typical ceramics and projectile points of the phase occur very early in upper east Tennessee, probably by at least AD 600. This is of interest in view of the Middle Woodland doldrums through which the area had passed. The early Hamilton occupation of the Kingsport area still leaves one with the feeling of transient camps and bases. Very little has been found to suggest the dispersed but well defined settlement pattern characteristic of the Hamilton groups farther to the south.

The Mississippian period in the Kingsport area is signalled by the appearance of the Pisgah ceramic series (Lafferty 1981). Locally, the name "Cobb Island" has been applied to this material (Polhemus and Polhemus 1966). This distinctive sand-tempered pottery, characterized by collared rims and loop handles, and typically decorated with stamped designs, is characteristic of the Appalachian area to the east where it has been designated "Pseudo-Iroquoian" (Kelly and Weitzel 1961) and is regarded as ancestral Cherokee (Dickens 1976; Keel 1976). Isolated occurrences of Pisgah material have been reported from the Clinch River (Dickens 1976; Polhemus and Polhemus 1966) and the Powell (Dickens 1976) valleys. The Holston-middle Nolichucky axis appears to be the westernmost area of concentrated occupation, with sites reported from Kingsport (Dean 1983: personal communication), Holliston Mills (40 HW 11, River Mile 130) (Dickens 1976; Schroedl, personal communication 1984), Phipps Bend (Lafferty 1981), Cobb Island (Polhemus and Polhemus 1966), and along the middle Nolichucky (McIlhany 1978). None of the excavations in the Kingsport area has produced information regarding house type or settlement size; rectangular houses with central hearths have been excavated at Cobb Island and at McCullough Bend on the Clinch River (Dickens 1976).

Although Pisgah ceramics appear to develop into historic Cherokee pottery (Qualla series) in the Appalachian Summit area, such is not the case on the Holston. Here, in late Mississippian times, there is an incursion of the Dallas culture from south of Knoxville. Dallas material is widespread in the Norris Basin on the Powell and Clinch rivers (Webb 1938), on the middle Nolichucky (McIlhany 1978) and is also reported for Kingsport (Dean 1983: personal communication), Holliston Mills (Dickens 1976), and Phipps Bend (Lafferty 1981). As is the case with the Pisgah material, none of the local excavations has given us an adequate picture of village plan or house types for the upper Holston. A better understanding of the relationships between the Pisgah and Dallas occupations of the upper Holston may well hold the elusive key to a better understanding of the origin of the historic Overhill Cherokee.

2.2.2 Ethnohistory

From earliest historic times, the Cherokee claimed lands from the Appalachians west to central Tennessee. Certainly the British recognized these claims in the 1720s, although the Shawnee and others seemed to have viewed the matter differently.

The first Europeans known to have been in the vicinity of Kingsport are James Needham and Arthur Gabriel, who apparently passed down the Holston valley in 1673 en route to trade with the Overhill Cherokee towns on the Little Tennessee River. Certainly Arthur Gabriel passed along the Great War Path through the Kingsport area in the following year, in company with a group of Cherokee to visit the Monetons (Mohetans?) then living near the mouth of Kanawha River in present-day West Virginia. Abraham Wood's (1928) letter describing the Needham-Gabriel travel does not mention Cherokee (or other Indian) towns in the immediate project area, but the Cherokee seemed to have passed through the region with impunity.

It is possible that John Peter Salley passed through the region in 1726. Salley, a captive of the Cherokee, was taken from Tennessee on a hunting trip to Kentucky. Although we have no particulars of his route, the trail up the Holston and thence west through Cumberland Gap may well have been followed (Withers 1895).

In the 1740s and perhaps even earlier, traders such as Cornelius Doherty, Samuel Stalnaker, and a man named Vaughan are known to have passed down the upper Holston to trade with the Overhill towns. They almost certainly passed through the Kingsport area, but unfortunately left no description of their travels (Williams 1936). It is unlikely that there are any archeological remnants of any of these early travelers.

The first unmistakable historic references to the Kingsport region are in the journals of Dr. Thomas Walker, who visited the forks of the Holston in 1748 and again in 1750. Maps of the period indicate that the English were settling at this time on the upper reaches of the river in Virginia. In 1748-49 Steven Holston journeyed down the river to the Tennessee and thence to Natchez. Walker's journals are probably the first to use the term "Holston's River" (Walker 1928). His entry of March 31, 1750, describes sites in the project area:

In the Fork between Holston's and the North River [probably east of the east end of the modern Rotherwood Bridge], are five Indian Houses built with loggs and covered with Bark, some whole Pots and Pans, some broken and many pieces of mats and Cloth. On the West Side of the North River, is four Indian Houses such as before mentioned, we went four miles below the North River [near modern River Mile 138] and Camped on the Bank of Holston's opposite to a large Indian Fort [Walker 1928: 170-171].

Walker's allusion to the large Indian fort, which must have been in the immediate vicinity of the present magazine area of the Holston AAP, is the only historic reference to an aboriginal town in the immediate Kingsport area that we have encountered.

2.2.3 History

Cabins of hunters, including those of Nathaniel Gist, Thomas Price, and Richard Pearis, were constructed on Long Island on the Holston across from modern Kingsport (Figure 1-1) by 1754 (Spoden 1977). It was not until 1761, however, that the earliest permanent Euroamerican structure was erected in the area--Fort Robinson, on the north bank of the Holston opposite the west end of Long Island. In order to reach the construction site, the "Island Road" from Chilhowee on the Tennessee River south of modern Knoxville to Long Island had been opened by Virginians (Spoden 1977). Both the road and the construction of Fort Robinson encouraged further settlement of the Holston area. The true historic period in the project area was at hand and Long Island, the fort, and the developing community of Kingsport became a nexus for the American settlement of Tennessee and Kentucky during the late eighteenth century.

History can be said to begin in 1761 in the Kingsport area with the construction of Fort Robinson. The garrison of 1000 men did much to persuade the Cherokee to make a treaty of peace and agreements for trade with the British. It was as a direct result of the "Treaty of Fort Robinson" that Lt. Henry Timberlake was sent downriver to the Overhill Towns.

With peace assured in the mid 1760s, most of the Fort Robinson soldiers returned to their homes in Virginia and North Carolina; one Virginia company remained to garrison the fort. Two of the Virginia men, Robert and Gilbert Christian, built cabins approximately one mile above the mouth of Reedy Creek (modern Kingsport) and planted crops for the coming year. They were to leave before harvest, but Gilbert Christian vowed to return.

During the 1760s, many families from Virginia moved through the area, down the Holston to the Tennessee and thence to Natchez. This movement was spurred by the heavy speculation in western lands that followed the signing of the Choctaw-Chickasaw (1765) and Cherokee (1768) treaties (Billington 1960). The following decade saw the opening of Daniel Boone's Wilderness Road, which originated at the mouth of Reedy Creek (modern Kingsport) and ran northwest into Kentucky. That decade also witnessed the rapid establishment of several settlements in the general project area--at King's Mill Fort, Fall Creek, Carter's Valley, on the Watauga near Sycamore Shoals, and on the Nolichucky. The Fall Creek settlement was established a few miles upstream from Long Island in 1773; by 1774, it contained 85 people (Spoden 1969).

In 1774, Col. James King established a mill at the mouth of Reedy Creek and in 1775 Gilbert Christian fulfilled his promise, bringing his

family to the Long Island from King's Mill Fort. The Christian family is regarded by local inhabitants as the first permanent Euroamerican settlers of the area (Spoden 1969).

Virtually all of the above settlements represented encroachments upon Indian land and treaty violations. The peace established by the Treaty of Fort Robinson was strained to the breaking point in the 1770s and there are many recorded instances of raids and retaliations during the period. Most of the Indian remonstrance was by the Cherokee, although it was the Shawnee who pillaged Carter's store (in Carter Valley, a few miles southwest of the Holston AAP) in 1774. The Holston valley formed a border between the Cherokee and Shawnee at this time. It was essentially controlled by the former, but subject to raids by the latter.

In 1776 the Euroamerican settlers of the Kingsport area were saved from a general massacre by an Indian woman, Nancy Ward, who warned them of the impending attack. The fierce Battle of Island Flats defeated the Indians. [Two other Cherokee forces, one led by Dragging Canoe, were to attack the Wataugan and Carter Valley settlement; hearing of the defeat at Long Island they retreated without doing much damage (Brown 1938).] The site of the battle is now downtown Kingsport. Fort Patrick Henry was built in 1776 on the North Bank of Holston River near Fort Robinson, as a garrison for the troops to be sent on a retaliatory campaign against the Overhill Cherokee. In November 1776, this force of 2,000 under Col. William Christian began destruction of the abandoned Indian villages in the region.

As a result of the destruction of the Indian homes the Treaty of Long Island (1777) was exacted, by which the Cherokee relinquished claim to all lands north of Nolichucky River (Royce 1887). All of the Indians were not in favor of the treaty and Dragging Canoe, son of Little Carpenter, withdrew with his followers down the Tennessee River to a site near Chattanooga.

Despite continued warfare with the Indians, the settlers from Holston participated in the Revolutionary War to protect their lands from the British, particularly in the decisive 1780 battle at King's Mountain that turned the tide of the Revolution in the South (Mooney 1975).

At the outset of the Revolutionary War, the people of the Wataugan settlement organized themselves into the Washington "military district." They were annexed to the state of North Carolina in 1777. The new Washington District was incorporated as Washington County (including all of present Tennessee) and in 1779 Jonesboro was designated the county seat. A Washington County petition to North Carolina for "salutary benefits of government" was denied in 1784 and North Carolina immediately ceded the entire Over-Mountain territory to the new United States government. In response delegates from Washington, Sullivan, and Greene counties met at Jonesboro to organize an independent western state to be called Franklin (Billington 1960:205; Works Progress Administration 1939), but this entity was short-lived.

Next the territorials organized "The Government South of the Holston and French Broad Rivers" (Works Progress Administration 1939). The North Carolina cession of the Tennessee lands was accepted by the federal government in late 1789, when Congress created "The Territory of the United States South of the River Ohio," commonly known as the "Southwest Territory."

The Holston AAP lies within both Sullivan and Hawkins counties. Sullivan County was established in 1779 and Blountville, the second oldest town in Tennessee, became the county seat in 1792. Hawkins County was formed from Sullivan County in 1786, with Rogersville becoming the county seat in 1789. Tennessee was declared an independent state and admitted to the Union in 1796. Though population in the Holston Valley area was sparse during this period, it began to increase as industry developed.

In 1784, Col. James King, who had earlier built the mill at the mouth of Reedy Creek on the Holston River, erected an iron furnace at the mouth of Steele's Creek in Sullivan County east of Kingsport. This was the first iron furnace erected in the state of Tennessee (Long 1928), and was the forerunner of industry in upper East Tennessee. Following the American Revolution and the treaty of 1783, a general peace ensued and settlers poured into the area. Industry and agriculture were carried on unmolested. By the turn of the century, four powder mills were in operation within the region. More "one man" industries sprang up, the iron industry being the most prosperous, and there were twenty-nine furnaces scattered through this area (Taylor 1909).

Kingsport, with its origins in the Long Island and Fort Robinson military and settlement activities, became an important river port. By 1800, 4000 barrels of salt, iron, bacon, and other commodities were shipped annually through Kingsport from the surrounding area. It was on the bank of the Holston River in Hawkins County (just north of the Holston AAP Area B) that Frederick Ross in 1818 built his historic home, "Rotherwood". Below the hills and back of the Old Elm he established his cotton mill, hauling his raw cotton from Knoxville. Not far from this site stood the Netherland Hotel, built by Richard Netherland (Benthall 1973), which stands today as a remnant from the area's historic past.

Kingsport served the surrounding area as its industrial hub and shipping center. By 1834, it contained 50 families, 317 inhabitants, two taverns, two stores, two physicians, one Methodist and one Presbyterian Church, and a good bridge across the north fork. Soon a hatter, tin shop, tailor, coppersmith, wagon maker, blacksmith, shoemaker, and harness and saddle maker were added (Long 1928).

In 1850 an attempt was made to dredge the Holston River channel for steamboat traffic to enlarge the shipping industry. At the same time, the building of a railroad from Virginia through east Tennessee to Georgia was contemplated. The natural route for the railroad lay through

Kingsport, following the historic trails. Promoters wanting the railroad to go through Jonesboro rather than Kingsport approached Col. Netherland and other Kingsport leaders to trade support for their railroad route for support for the dredging project. Since Kingsport had at least one transportation system already (the river traffic) and needed lobbying help for the dredging appropriations, they acquiesced. "The railroad went by Jonesboro, but the river appropriation never went anywhere" (Long 1928).

The loss of the railroad and the Civil War caused economic stagnation around the Holston area, since post-war shipping was primarily by rail. Although the countryside had been torn apart by the war and Union sentiment was strong in Hawkins County, there was only one major local skirmish, the battle of Rotherwood (also called the battle of Kingsport). (Ross' home, "Rotherwood," was burned during the last year of the war. Later a new Rotherwood was built just below the forks of the Holston; it remains today and is properly known as the J. Fred Johnson house.) The battle left the community paralyzed industrially and agriculturally, and disorganized socially. Some industries never recovered. It was not until 1909, when the first locomotive on the Carolina, Clinchfield and Ohio Railroad roared into the territory, that the town awakened from its slumber.

Kingsport, surrounded by level meadows skirted by the river and its wealth of untouched resources--virgin tracts of timber, mountains of shale, limestone and silica, other rich mineral resources and the coal fields of Virginia and Kentucky at its back door--was a natural site for an industrial empire. The period from 1900 until World War II was one of rapid growth for the Holston area. New factories were added each year including hosiery mills, cement and shale production, tanneries, Eastman Kodak, a book plant, textile and belting companies, glass manufacture, and foundry and manufacturing, with Pennsylvania-Dixie Cement Corporation ranking among the largest in the country. During World War I, the Federal Dye and Chemical Company was in operation. This industrial center served the surrounding counties, providing jobs for the populace.

Agriculture in the fertile valleys of this area is enhanced by winding Reedy Creek and other streams. Tobacco, grain and other marketable products are supplemented by produce which is preserved for use throughout the year.

Due to careful planning by the city and industry, the Kingsport area did not suffer the crushing Depression that hit much of the rest of the country. During 1932, the Eastman Corporation began production of acetate yarns and plastics, and the processing of timber and lumber. From 1935 to 1945, industrial employment in the area grew from 3824 to 19,672. Further influencing the growth of Kingsport was the building of the Holston Ordnance Works between 1942-43 (Englander 1946). Fifteen thousand people were employed during its construction and five thousand on a regular operating basis. Following the war and the shutdown of the

plant, these five thousand were absorbed in the work force within a year. Between February 1, 1944 and August 7, 1945, Holston Ordnance Works was the largest high explosive production plant in the world.

After four years on standby status, the plant was reopened in 1949 as the Holston Army Ammunition Plant. Operated by the Holston Defense Corporation, a subsidiary of Eastman Kodak, it continues to function as a major center for the production of specialized explosives.

Hawkins County at the turn of the century remained a center for farming, crafts and small mercantile operations. Today Hawkins County is experiencing population growth and technological development characteristic of upper east Tennessee--an area rapidly becoming a high-technology corridor. The Johnson City-Kingsport-Bristol Standard Metropolitan Statistical Area ranks as the ninety-second largest market area in the United States, has approximately 431,638 inhabitants, and provides jobs for over 160,000 workers. At present, this area offers the opportunities of rural environment coupled with the benefits of urban life (Wolfe 1983).

Kingsport, in Sullivan County, is the merchandising and recreational center for an area extending many miles. Roads from five states converge at Kingsport. The population of Hawkins and Sullivan counties had expanded to more than 187,000 souls by 1980 (Anonymous 1983).

A unique event occurred in Kingsport in the long history of land cessions between the Cherokee and the United States. On the occasion of America's Bicentennial, the Mead Corporation gave the westernmost section of the Long Island, opposite the Boatyard Historic District, to the City of Kingsport for its preservation as a National Historic Landmark. A condition of the deed required that part of the land be returned to the Eastern Band of the Cherokee Indians. On July 16, 1976 the City of Kingsport presented the Cherokees with a portion of the Long Island of the Holston (Spoden 1977).

Today, Kingsport remains both aware and proud of its historic heritage. Not only have the Boatyard Historic District, Long Island, Wetherland Inn, and the Old Kingsport Presbyterian Church been placed on the National Register of Historic Places, but so too have Roseland, Mount Ida, Spring Place, the Wills-Dickey Stone House, the J. Fred Johnson house (contemporary Rotherwood), Circle Church District, and the Clinchfield Railroad District. Although none of these properties is on Holston AAP land, all are within a five mile radius of the facility (Froeschauer, personal communication 1983). Information concerning these NRHP properties can be obtained through the office of the Tennessee State Historic Preservation Officer.

2.3 ARCHEOLOGICAL RESEARCH DIRECTIONS

2.3.1 Regional Concerns

A state preservation plan is still in the process of being developed by the Tennessee State Historic Preservation Office (SHPO) (Fiedler,

personal communication 1983); study units and major research questions have not yet been defined for the area of the Holston AAP. Based on previous research, however, archeological research concerns in upper East Tennessee (generally that portion of Tennessee north and east of Knoxville) can be phrased in terms of:

- constructing a cultural chronology
- reconstruction of local cultural ecology
- inter-regional synthesis
- interpretation of cultural processes

At the risk of simplification, these four areas roughly address the problems of (1) who lived in the area and when; (2) how did they use the local resources in order to exist; (3) how does this region relate to adjacent ones; (4) what patterns, regularities, or laws of cultural operation can be extracted from all of this.

These four problem areas actually define the general stages of archeological study anywhere. It should be emphasized that local studies (problems one and two), regional comparison and integration (problem three), and cultural generalizations (problem four) must proceed more or less in order.

The first order of business, then, is to determine the cultural sequence for the region. This requires preliminary field investigations to determine the types of occupations present and their general distribution within the region (site survey). Limited excavations at stratified and single component (single occupation) sites should be undertaken to determine the relative and absolute ages of the various types of occupations (test excavations).

Unfortunately, there have been few systematic site surveys in upper East Tennessee and even fewer test excavations upon which a regional chronology can be based. Specific problems that remain to be addressed include (1) the intensity, distribution, and chronology of the Paleo-Indian and Archaic occupations in the area; (2) the distribution and chronology of the various early Woodland occupations; (3) the intensity, distribution, and chronology of middle Woodland complexes in the area (if they indeed exist); (4) the distribution and detailed chronology of late Woodland and Mississippian phases there. Answers to these questions will tell us who was in the area and when.

Given this very basic framework, the nature of each occupation must be determined. A great deal can be learned if we can find out what these people ate, where and how they got it, approximately how large the groups were, how seasonal availability of food affected group size and mobility, and what kinds of tools, shelters, and other things they made. Much additional information can be extracted from the archeological record, but these are critical questions to understanding the general ways of life that are represented. This type of knowledge requires more extensive excavation and intensive analysis. A handful of local

excavations has provided much of this information for certain sites or certain small sub-areas within the region, but it can be asserted safely that we do not have this information for upper East Tennessee as a whole for any time period.

Although we do not understand the region adequately for any particular time period, there is much to suggest that interesting relationships exist between upper East Tennessee and adjacent areas. This is based primarily on the distribution of a limited number of tools and other artifacts, especially projectile points and types of pottery. We do at least have enough to know that regional interrelations do exist throughout Paleo-Indian, Archaic, Woodland, and Mississippian times, and that certain widespread artifact types (e.g., the Swannanoa and Pisgah ceramic series) occur as distinctive regional variants in upper East Tennessee. Their relations beyond the area may well be critical to resolving problems which exist in other, nearby sections of the country.

Given the minimal amount of information available, we can speak only of the kinds of cultural patterns, regularities, and laws that might be induced from adequate knowledge of upper East Tennessee and adjacent regions. They will involve culture change and stability (two facets of a single problem), the manner and efficiency with which various culture types used their environment (some kind souls assume that all prehistoric societies, unlike our own, operated at peak efficiency), and general statements of environmental determinants and limitations of cultural complexity.

Many of these concerns are as applicable to the historic as to the prehistoric period. Bridging the gap between late prehistoric archeological complexes and known historic groups (the so-called proto-historic period) has rarely been accomplished satisfactorily; the origins of the Cherokee are a case in point. With the beginning of the full historic period, however, we will at least know who lived in the area and when. But do we really know what people were eating in AD 1750, 1800, or 1850; the extent and efficiency to which they exploited their environment; the environmental determinants and limitations of Kingsport in the 1850s or 1980s? Many of these questions must be answered by intensive archival review. Others, however, can be answered only on the basis of excavation of historic settlements, outhouses, cisterns, and trash heaps, coupled with the types of comparative analysis described above.

2.3.2 Installation-specific Archeological Research Directions

By the very nature of the Holston AAP's location on the upper Holston River, along which we know much ethnohistoric as well as historic movement took place, the archeological resources, both prehistoric and historic, on the facility have tremendous potential value. Quite simply, they can contribute to the resolution of all regional problems discussed above.

The interpretive potential of local resources has been greatly enhanced by Lafferty's (1981) recent work at Phipps Bend, downstream on the Holston between river miles 120-123. His data both pose sub-areal problems and provide a basis for comparison of information from the Holston AAP. In addition, the recent excavation of Eastman Rockshelter (Faulkner 1983) at Kingsport creates additional questions about the Archaic use of the study area.

The difficulties in defining general Paleo-Indian and Archaic occupations in the area have been mentioned. Paleo-Indian sites can be expected to be quite sparse and it would be a stroke of fortune to locate one on the AAP. Nonetheless, the complete range of local landforms in the region is available for investigation and we know that Paleo-Indians were present in the area.

The Archaic is a different matter. At least some evidence should be present, yet Lafferty found only circumstantial evidence of late Archaic at Phipps Bend.

Early Woodland sites will be of extreme interest; the presence of the very early and distinctive Swannanoa material should be investigated carefully.

Evidence for the elusive Middle Woodland, or any sites dating to the time period AD 1-600, will be of scientific importance.

Relationships between late Woodland (Hamilton), Pisgah, and Dallas phase Mississippian are very complex. McIlhenny's (1978) work on the Nolichucky helped to define certain problems that must be dealt with and there is every reason to believe that sites on the facility may be very important in this regard.

The difficulties with the proto-historic period have been mentioned. In this connection, Walker's 1750 reference to the Indian fort in Solitude Bend must be followed up. This will be a very important site if it remains with integrity.

Excellent opportunities may also exist on the facility to study early historic period and rural developments. Later, traditional historic concerns such as the Civil War and industrial development may be of minimal concern to facility projects if the archival documentation is sufficient for addressing questions about the last century.

The items listed above are largely of a cultural historical nature. The Holston AAP is large enough to permit more detailed interpretation, especially on the general topic of cultural ecology, if intact resources remain. Archeological sites have been relatively protected from casual vandalism, collecting, and other such destructive activities as an indirect result of plant security. There may well be no better place in the upper Holston valley to obtain information on settlement patterns,

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food-getting techniques and the seasonal round, and related problems. In this connection, we hope that the Holston AAP will guard its resources carefully from inadvertent, internal damage as well as from external intrusion, and that it will appreciate the importance of using its cultural resources wisely and to best advantage.

AN ASSESSMENT OF ARCHEOLOGICAL RESOURCE PRESERVATION AND SURVEY ADEQUACY

3.1 ENVIRONMENTAL CONSTRAINTS TO SITE PRESERVATION

The two major environmental factors affecting site preservation in the facility area are water erosion and sedimentation. A third factor of some consequence is the acidity of local soils. Frost action, perturbation by rodents and earthworms, tree-fall, and other local environmental factors may also have essentially site-specific effects that cannot be dealt with satisfactorily in a general context.

Erosion is a true "constraint," in that it destroys sites. Its effects are most pronounced on slopes, exterior curves of rivers, and upstream portions of islands. Wave action can also be considered a form of erosion. Natural erosion may actually remove small artifacts from sites and wash them downhill. Larger objects, particularly flat ones, tend to remain in place while the soil matrix is washed away. These larger objects are physically "dropped" vertically below their original context. The end result can be a surface covered quite densely with a mixture of artifacts from many time periods, all having been sequentially dropped from a once-stratified cultural deposit. Paleo-Indian sites, frequently located in higher elevations or exposed along river banks by wave action, have been particularly subject to this process.

Sedimentation is not a true constraint to archeological resources preservation. It may even promote rather than constrain preservation of sites by burying them. Admittedly, such wellpreserved sites are difficult to locate and are thus removed from the surficial archeological record. Chapman (1977), however, has had considerable success in uncovering deeply buried Archaic sites that are in excellent condition in the Little Tennessee River valley.

Sedimentation occurs on lower (flatter) slopes, in any natural depression, on interior curves of rivers, and on the downstream ends of islands. It is generally the result of decreased water flow (velocity). Sites of many types are located in bottom lands where, if cultural activity does not promote sheet erosion, they are frequently subject to burial by sedimentation.

Acid soils have a selective effect. They may destroy burials and artifacts made of raw materials such as bone, copper, or limestone, but

have little if any effect on lithics and selective impact on ceramics, depending upon paste composition and firing temperature. The islands and floodplain of the Holston River in Area B are only slightly acid to neutral, and chances for preservation of bone artifacts and burials are good on sites located on these (Staser) soils. The low terraces both south of the river (magazine area) and north of the river (south and east of the production area) are composed largely of Holston-Cloudland and Altavista series soils, respectively. Both series are strongly acid and bone preservation is expected to be poor in sites located on these terraces.

3.2 HISTORIC AND RECENT LAND USE PATTERNS

Areas of known ground disturbance on the Holston AAP are summarized in Table 3-1 and mapped in Figure 3-1.

The primary land use pattern that has had a negative effect upon archeological resource preservation on the Holston AAP property is of course the construction of the facility. Previously, most of Area B was a dairy farm. Secondary types of land use that may have had adverse impacts on cultural resources there are (1) the excavation of areas for fill dirt and various forms of waste disposal, and (2) row-crop farming.

Plant construction involved massive foundation excavations, levelling, and ditching, particularly throughout Area A and the shop and production areas in Area B. Any archeological sites in these regions can be assumed to have been obliterated. Construction in the magazine areas involved scraping surface soil with bulldozers toward central points (bunkers), in order to provide a minimum of two feet of soil over the roofs of these structures. Examination of construction photographs (Englander 1946:13) indicates that roughly 50 percent of the level soil in the magazine areas was disturbed, probably to depths of two to three feet. Moderate to major disturbance has also accompanied the construction of office and residential structures on the AAP and the interplant railroad that joins Areas A and B. Long right-of-way cuts may also have exposed buried sites along the edges of the railroad line.

Areas subsequently excavated for reservoirs, fill dirt, and the disposal of wastes such as tar and fly-ash have not been tabulated individually, although several were observed during a visit to the AAP. These excavations are typically deep but may be limited in horizontal scope. They are characteristically located in the unimproved periphery of Area B, where archeological sites may still be intact. Any cultural deposits lying within their limits will be destroyed.

Leases are let by the Holston AAP operators (HDC) to private individuals for a variety of purposes: timber leases on the mountain slopes and agricultural leases on the upper terraces (hay) as well as the lower terraces and bottomlands (row crops). Timber and hay leases do minimal damage to areas in which site density is likely to be moderate at

Table 3-1. SUMMARY OF HISTORIC AND MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE AT THE HOLSTON AAP

ODA No. ^a	Type of Disturbance	Date Con- duct- ed (yr)	Reference	Area Dis- turbed (acres)	Esti- mated Depth Below Surface (ft)	Ratio of Dis- turbed to Total Area	Location of Disturbed Area					USGS Quad Map ^c	Calcu- lated Sited ^d	
							UTM (Zone 17)	Northing	Easting	Topo- ship	Range			Section
1	Construction Area A	1943	Facility plan (Englander 1946)	45	6+	10:10	4043425 4043595 4043955 4043690	361260 361445 360960 360755	..... ..... ..... .....	MA... - - -	EFTM EFTM EFTM EFTM	None	
2	Construction Production Area; Area B	1943	Facility plan (Englander 1946)	195	6+	10:10	4043820 4044895 4044150 4043215	333000 333465 335215 334725	..... ..... ..... .....	MA... - - -	CHTM CHTM EFTM EFTM	None	
3	Construction West Shop Area; Area B	1943	Facility plan (Englander 1946)	35	6+	10:10	4043820 4044115 4044525 4044560	333000 332340 332550 333326	..... ..... ..... .....	MA... - - -	CHTM CHTM CHTM CHTM	None	
4	Construction North Shop Area; Area B	1943	Facility plan (Englander 1946)	35	6+	10:10	4044480 4044895 4045275 4045035	334695 333465 334105 334730	..... ..... ..... .....	MA... - - -	EFTM CHTM CHTM EFTM	N-12, N-13	
5	Construction Y Magazine; Area B	1943	Facility plan (Englander 1946)	10	0.5- 3.0	5:10	4044280 4044895 4044620 4044465	331180 331615 331605 331920	..... ..... ..... .....	MA... - - -	CHTM CHTM CHTM CHTM	None	
6	Construction of Main Magazine; Area B	1943	Facility plan (Englander 1946)	145	0.5- 6.0	5:10	4043480 4043685 4042315 4041235 4041790 4042845	331270 330060 330265 330710 332335 332460	..... ..... ..... ..... ..... .....	MA... - - - - -	CHTM CHTM CHTM CHTM CHTM CHTM	N-2, N-3 N-4, N-5 N-6, N-7 N-8, N-9	
7	Inter- Plant Railroad	1943	Facility plan (Englander 1946)	30	0.5- 6.0	8:10	4044010 4044870 4045000	336000 338000 339325	..... ..... .....	MA... - -	EFTM EFTM EFTM	None	

Table 3-1. SUMMARY OF HISTORIC AND MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE HOLSTON AAP
(Concluded)

GDA No.	Type of Disturbance	Date Conducted (yr)	Reference	Area Dis- turbed (acres)	Esti- mated Depth Below Surface (ft)	Ratio of Dis- turbed to Total Area	Location of Disturbed Area					USGS Quad Map	Coinci- dental Sites	
							Northings	Eastings	UTM (Zone 17)	Legal Reference ^b				
										Town- ship	Range Section			
8	Agricultural Lease 1; Area B	1944ff.	Facility Files	20	0.5- 3.0	5:10	4043270 4043430 4043525 4043410 4043000	352075 352105 352785 353200 353165	..... ..... ..... ..... .....	..... ..... ..... ..... .....	CHTN CHTN CHTN CHTN CHTN	None
9	Agricultural Lease 4; RR r.o.w.	1944ff.	Facility Files	5	0.5- 3.0	5:10	4044950 4045000 4045080 4045080	359000 359290 359335 358945	..... ..... ..... .....	..... ..... ..... .....	EPTN EPTN EPTN EPTN	None
10	Agricultural Lease 9; Area B	1944ff.	Facility Files	5	0.5- 3.0	5:10	4045085 4045275 4045050	351315 351515 351750	..... ..... .....	..... ..... .....	CHTN CHTN CHTN	None
11	Agricultural Lease 12A; Area B	1944ff.	Facility Files	35	0.5- 3.0	5:10	4042785 4042845 4043685 4043785 4043150 4042980 4042915	352470 352460 350060 349965 352000 354645 354645	..... ..... ..... ..... ..... ..... .....	..... ..... ..... ..... ..... ..... .....	CHTN CHTN CHTN CHTN CHTN EPTN EPTN	M-1
12	Agricultural Lease 12B; Area B	1944ff. ff.	Facility Files	25	0.5- 3.0	5:10	4042315 4042315 4043685 4043785	349620 350265 350060 349965	..... ..... ..... .....	..... ..... ..... .....	CHTN CHTN CHTN CHTN	M-1
	Reservoirs, Fill and Refuse Pits	1943	Facility Files	(Widely scat- tered small areas)	6+	10:10	-	-	-	CHTN	

^a Ground Disturbance Areas (GDAs) as mapped in Figure 3-1.

^b Legal descriptions phrased in township, range, and section divisions have not been applied to this part of the United States.

^c EPTN - USGS 7.5 min quad., Kingsport, TN-VA 1959, photorevised 1968 and 1978; CHTN - USGS 7.5 min quad., Church Hill, TN-VA 1959, photorevised 1973.

^d Known or potential archeological sites coincidental with these GDAs are described in Section 4.0.

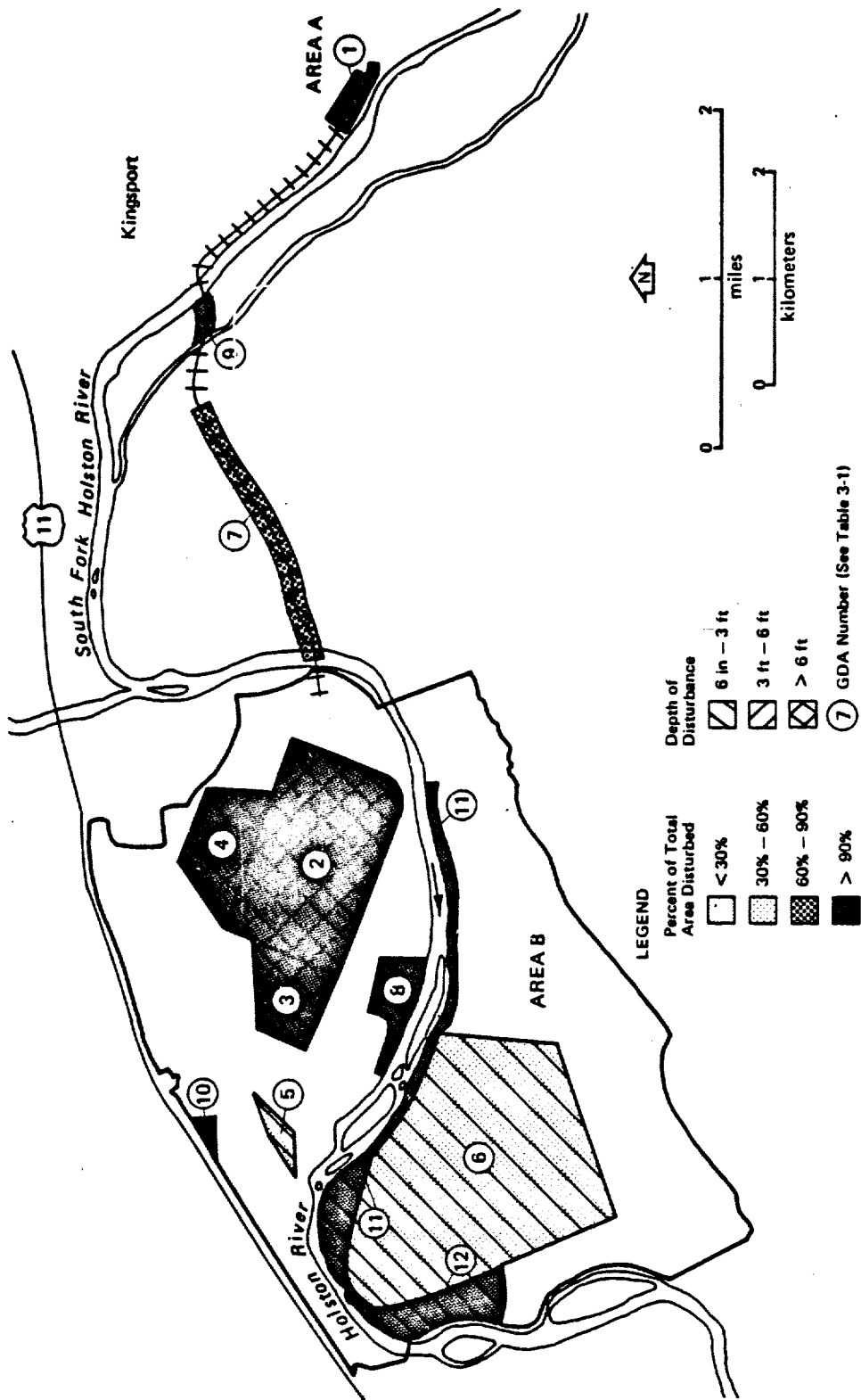


Figure 3-1. MAP OF AREAS OF HISTORIC AND/OR MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE HOLSTON AAP

best. Bottomland row cropping is conducted primarily on Staser soils in precisely the areas that have the highest potential for archeological sites. The plowing methods used for row cropping are destructive to archeological sites, churning deposits and hastening erosion. No deep plowing or chisel plowing is known to have occurred (Miller 1983: personal communication). Heavily plowed sites typically show a dense concentration of culturally mixed artifacts in the plowzone, overlying culturally sterile soil into which lower portions of aboriginal pits, postholes, and other dug features can be traced. Of course archeological midden deposits that were originally very thick may not have been plowed away completely.

In summary, the general areas of maximal site disturbance of the Holston AAP are: Area A (100 percent); Shop and Production areas in Area B (100 percent); Magazine areas in Area B (50 percent); Interplant Railroad (80 percent); fill, reservoirs, excavations, and waste disposal pits (100 percent); areas currently being row-cropped (indeterminate).

3.3 PREVIOUS CULTURAL RESOURCE INVESTIGATIONS; COVERAGE AND INTENSITY

The only activity that merits discussion in this section is the excavation at a single Woodland site by members of the Kingsport Chapter of the Tennessee Archeological Society (Heglar 1978). This work has not been written up or published.

In short, there has been no attempt made to professionally inventory archeological resources that may remain on the Holston AAP. The terms "coverage" and "intensity" are not applicable.

3.4 SUMMARY ASSESSMENT OF DATA ADEQUACY, GAPS

The archeological resource base of the Holston AAP is unknown for all cultural periods, except for some data that may be recoverable from the single excavation that took place in Area B (see Section 4.0). A specific data base adequate for future planning or management needs does not exist.

KNOWN ARCHEOLOGICAL RESOURCES ON THE HOLSTON AAP

4.1 KNOWN ARCHEOLOGICAL RESOURCES

The only known archeological resource on the facility is site 40 HW 15, which is summarized in Tables 4-1, 4-2, and 4-3 and whose locational data are provided in Appendix A. This site is located on the Holston River floodplain in the southeast part of Area B (Austen 1983: personal communication; Heglar 1978), and has been identified as a prehistoric Woodland occupation. A large portion of the site was reportedly excavated in the 1970s by members of the Kingsport Chapter of the Tennessee Archaeological Society, to salvage materials earmarked for partial destruction by construction of an industrial wastewater treatment lift station and a large underground forced-main pipeline. The excavations were supervised by Jim Buchanan, who still lives in Kingsport (Table 4-1).

Site 40 HW 15 is reported to have originally been two to three acres in extent, with a fairly dense surface distribution of Woodland materials that may reflect Early and/or Middle Woodland occupations. There was little evidence of subsurface midden in the site, but many storage and cooking pits were encountered that apparently had archeological depth and integrity and were not fully salvaged. In addition, several poorly preserved human burials were recovered. Field notes and an artifact catalogue are reported to have been kept during the excavations and to be privately held by Society members today. All the collected materials were retained in private collections, and apparently have not been described and analyzed; the results of the excavations have never been fully published. Individuals involved with the early excavations report that only half of the site was excavated in the 1970s, and they believe that the rest may remain intact. No other professional review of the site has been conducted, but the site may retain archeological integrity, human burials, and scientific information of importance. If so, it may be eligible for nomination to the National Register of Historic Places. Section 6.0 includes a discussion of the management needs of this reported site area.

4.2 POTENTIAL ARCHEOLOGICAL RESOURCES

There are three categories of potential archeological resources on the facility: historic resources with known locations; historic

Table 4-1. PRESENTLY IDENTIFIED ARCHEOLOGICAL RESOURCES ON THE HOLSTON AAP: ADMINISTRATIVE DATA

Site Number ^a	Site Recorder	Date of Site Record	SHPO Survey Number	Site Record Repository	Survey Collection Policy ^b	Current Status of Investigation ^c			Architectural Association	Bibliographic Reference
						REF, PEM	UNEV	State, Local Status		
40 HW 15	Tennessee Archaeological Soc.	Undated (Known from the 1970s)	None	McClung Museum, U. Tennessee	Unknown	REF, PEM (excavations done in the 1970s)	None	None	None	Summary comment, Heglar 1978

^a Site registration numbers are a trinomial designation following a system set up by the Smithsonian Institution in the late 1940s. The first segment of the trinomial is a numerical label for the state (e.g., Tennessee = 40), the second segment is a two-letter abbreviation for the county (e.g., HW = Hawkins), and the final segment is a sequential identification of the sites registered within that county and state. Site locational data are provided in Table A-1 and Figure A-1.

^b Survey collection policies vary widely, both on a site-to-site basis within a single survey project as well as among different surveys. Collection policies of the survey identified here are unknown.

^c Levels of archeological site investigation to date, and current site status, include filing of an inventory record (REF), surface collection (SCL), testing (T), scientific excavation as research not part of a mitigation program (SR), scientific excavation as part of a mitigation program (SEN), paraprofessional excavation as part of a mitigation program (PEM), and/or the need for further study and evaluation (EAS).

^d INSF - insufficient information available by which to make a judgement as to the site's National Register of Historic Places (NRHP) status; UNEV - sufficient information appears to be available, but no specific evaluation of eligibility has been made; REP - recommended as eligible by qualified professionals with no formal agency or SHPO concurrence; RIA - recommended as eligible by federal agency, but no further concurrence from SHPO or NRHP; RIA - recommended as ineligible by federal agency with no formal SHPO concurrence; REAS - recommended as eligible by agency with SHPO concurrence; RIAS - recommended as ineligible by agency with SHPO concurrence; SRG - approved for listing by state review board; SBI - judged ineligible for listing by state review board; NRE - determined by the NRHP to be eligible for listing; NRI - determined by the MHP to be ineligible for listing; NRL - listed in the NRHP.

Table 4-2. PRESENTLY IDENTIFIED ARCHEOLOGICAL COMPONENTS ON THE HOLSTON AAP: DESCRIPTION AND EVALUATION

Site Number	Unit Age			Unit Description					Evaluation						
	Date		Temporal Unit	Depositional Context	Landform	Dimension		Ascribed Function	Percent Intact	Value Integrit ^e	Value				
	DW ^a	Years BC/AD	Tradition (Period) ^b			Phase	Area (m ²)					Depth (m)			
40 HW 15	REL	1000 BC to AD 1200	Woodland	Unknown	FL, PC, MR	PT, BR	Midden	Floodplain	10,000	UN	--	50	Unknown	3	2

^a Dating methods (DM) include radiocarbon (RC), thermoluminescence (TL), geochronology (GEO), dendrochronology (DEN), fluorescence (FL), hydration (HY), and/or relative (REL) based on artifact attributes or a combination of these.

^b FL - flaked lithics, which may or may not be accompanied by hammerstones or other flaking stone tools; PC - prehistoric ceramics; MR - human remains.

^c PT - pits no more than 1 m. diameter; BR - formal human burials.

^d National Register of Historic Places evaluation criteria; L - location, D - design, M - materials, W - workmanship, A - association.

^e This is a subjective summary assessment of the overall research value (RV) of the identified components. It is an evaluation of the resources quality of preservation, representation of activity diversity or uniqueness, and temporal distinctiveness or reflection of diachronic relationships. It incorporates the need to avoid triviality, but to acquire what may be redundant data so as to discern patterns among those data. Research values are ranked from 0 (no value) to 5 (highest value).

^f This is a rating of the confidence (CR) the authors have in the previously assigned research values (RV). 1 - judgement is more guess than science, and likely not to be reliable; 2 - judgement is moderately reliable; 3 - judgement is most likely to be reliable.

Table 4-3. PRESENTLY KNOWN ARTIFACT, ECOFACT, OR DOCUMENTARY COLLECTIONS FROM ARCHEOLOGICAL RESOURCES ON THE HOLSTON AAP

Site Number, Name	Collection Location	Collection Characteristics					
		Artifact		Ecofact		Documentary	
		Curatorial Repository	Accession Number(s)	Brief Description ^a	Size/No.	Brief Description	Size/No.
40 HW 15	Private collectors ^b	None	None	FL, PC, HR	Unknown	Unknown	Unknown

^a FL = flaked lithics, which may or may not be accompanied by hammerstones of other flaking stone tools; PC = prehistoric ceramics; HR = human remains.

^b Artifacts are known to be in local private collections maintained by Mr. Jim Buchanan, Rural Route 11, Kingsport, TN; and Mr. Elmer Austin, 319 Holston, Mt. Carmel, TN.

resources identified by references with only approximate locations; and ethnohistoric resources anticipated on the basis of historic references to sites on the modern Holston AAP property.

The historic structures with known locations that may have some present archeological integrity are those shown on the 1959 Church Hill and Kingsport, TN, USGS 7.5 min. quadrangle sheets. One road shown on those maps (Solitude Bend road; Figures A-2, A-3) also may be of historic archeological significance. Because many of these may well be more than 50 years old (the minimum age for the National Register of Historic Places), they should be reviewed. Log cabins, frame houses, and barns may still exist. None of these resources has been professionally evaluated, nor are any presently recorded as archeological sites. We have no information about the recording of any of these resources by the Historic American Buildings Survey (HABS) of the National Park Service. Local sources (William Miller, personal communication 1983) also refer to a log structure once located somewhat east of the scale house (Bldg. 402A) in Area B that may still have some remnants; we have identified it as potential site H-14. These sites are summarized in Table 4-2, and their locational data are presented in Appendix A.

There is only one known historic reference to a Native American site on the property. This is Walker's (1928) 1750 mention of the "Indian fort" located about four miles below the forks of the Holston (see Section 2.2.2). This does not appear to be the same site as 40 NW 15, and should be investigated. Because its location is so vague we have not included it with the listed potential sites of Table 4-4.

Other prehistoric archeological sites are known by Tennessee Archeological Society members to exist on the facility, but have never been formally inventoried or even noted on maps as "potential" sites. Kingsport Chapter members who may be able to be of assistance in the identification of these resources include Mr. Jim Buchanan and Mr. Elmer Austin (Table 4-3), Mr. Lynn Haynes and Ms. Christa Lane of Kingsport, and Mr. William E. Jones of Fall Branch, TN (Austin, personal communication 1983).

4.3 PRESENTLY KNOWN ARTIFACT, ECOFACT, OR DOCUMENTARY COLLECTIONS FROM ARCHEOLOGICAL RESOURCES

Because there has been no archeological site survey of the facility and but one excavation, known archeological artifact, ecofact, and/or documentary collections from Holston AAP cultural resources are limited to those made during the investigations at 40 NW 15. None of these excavated materials is presently curated in a public institution, and the status of the human burials is currently unknown. Collectors known to have some privately-held material from this excavation are identified in Table 4-3.

Table 4-4. POTENTIALLY IDENTIFIABLE BUT NOT PRESENTLY RECORDED ARCHEOLOGICAL RESOURCES ON THE HOLSTON AAP

Site Number, Name ^a	Reference ^b	Description	Research Value ^c
H-1	CHTN39	Historic structure	1
H-2	CHTN39	Historic structure	1
H-3	CHTN39	Historic structure	1
H-4	CHTN39	Historic structure	1
H-5	CHTN39	Historic structure	1
H-6	CHTN39	Historic structure	1
H-7	CHTN39	Historic structure	1
H-8	CHTN39	Historic structure	1
H-9	CHTN39	Historic structure	1
H-10	CHTN39	Historic structure	1
H-11	CHTN39	Historic structure	1
H-12	KPTN39	Historic structure	1
H-13	KPTN39	Historic structure	1
H-14	Andrews 1983; Goodwin 1983	Log structure	1
H-15	CHTN39	Historic Solitude Bend road	1

^a Sites have been given "potential site register numbers" only within the context of this overview and planning effort, and are numbered sequentially across the facility. Their locational data are provided in Table A-1, and they are illustrated in Figures A-2 and A-3.

^b CHTN39 = USGS Church Hill, TN-VA 7.5 min. quad (1939); KPTN39 = USGS Kingsport, TN-VA 7.5 min. quad (1939).

^c The Confidence Rating (CR) of the potential resource base's research value is a general assessment (based on available data) of the authors' confidence in the site's physical integrity and value (e.g., representation of activity diversity or uniqueness, temporal distinctiveness or reflection of diachronic relationships, representativeness). The CR is a ranked assessment: 1 = the site is likely to have little value or the information about it is too unreliable for making a value judgement; 2 = the resource may have research value and the authors are moderately confident that the information about it is reliable; 3 = the resource is likely to have high research value and the authors are quite confident that the information about it is reliable.

AN ASSESSMENT OF THE SIGNIFICANCE OF THE
ARCHEOLOGICAL RESOURCE BASE ON THE HOLSTON AAP

5.1 THE SIGNIFICANT RESOURCE BASE

The archeological resource base of the Holston AAP is very poorly documented at present. However, data presented in previous sections indicate that it is likely that intact historic and prehistoric cultural deposits with integrity and scientific or humanistic value may exist along the floodplains and undisturbed uplands of the AAP (Table 5-1).

The anticipated archeological resources on Area B of the Holston AAP can be deduced from the summary sections on the physical environment (Section 2.1), the cultural environment (Section 2.2), and the known and potential archeological sites (Section 4.0). Area B possesses four major attributes that greatly enhance its potential for retaining significant archeological resources: (1) the presence of a major Woodland site known to exist within it; (2) its relatively large area on both sides of the Holston River on a major prehistoric and historic thoroughfare; (3) its wide variety of landforms, extending from mountain to floodplain; and (4) its recent history of security, which has served to protect its resources from collectors and vandalism.

It is reasonable to expect that any part or even all of the total prehistoric archeological sequence for upper East Tennessee is represented on the facility, and some historic structures are likely to have archeological remnants there. Although there has been considerable construction and farming disturbance on the AAP, much of the facility remains undeveloped. Prehistoric gathering and horticultural sites may be found on islands, flood plains, terraces, and along streams of the AAP. Hunting stations (more difficult to locate) may be found on virtually any landform.

The prehistoric resources may represent periods from Paleo-Indian to Mississippian or even protohistoric occupations. Any sites dating to the earlier periods, if they have sufficient integrity, would be extremely valuable in enhancing the understanding of early human occupations in east Tennessee. As section 2.3.2 points out, the Holston AAP may contain better evidence for answering both local and regional prehistoric research questions than might any other place in the Holston Valley.

Table 3-1. SUMMARY OF SIGNIFICANT ARCHEOLOGICAL RESOURCES ON THE HOLSTON AAP

Temporal Unit	Thematic Unit	Resource Type	Type Occurrences ^a			Sociocultural Association	Landform Association	Physical Integrity	Research Value ^b	Sociocultural Value ^c	
			Known Occurrences (no.)	Potential Occurrences (no.)	Other Likely Occurrences (no.)					Research Value ^b	Sociocultural Value ^c
Industrial tradition	Socioeconomic history	Dumps, foundations with associated artifacts	0	14	+	Euroamerican	Variable	Unknown	1	2	2
Ethnohistoric Frontier	Frontier cross-cultural interactions	Village, perhaps palisaded	0	0	++	Native American	Floodplain or terrace	Unknown	5	3	3
Middle or Late Woodland	Settlement and subsistence patterns	Village, perhaps agricultural fields, cemeteries	1	0	++	Native American	Floodplain or terrace	Likely to be good	5	3	3
Archaic	Settlement and subsistence patterns	Small camps or seasonal habitation sites	0	0	-	Native American	Terrace or rockshelter	Unlikely to be good	3	2	2
Paleo-Indian	Settlement and subsistence patterns	Small camps, kill and/or butchering sites, isolated projectile points	0	0	-	Native American	Variable	Unlikely to be good	3	2	2

^a The number of presently known or potential archaeological resources of this type is specified here. In addition a judgement has been made as to the likelihood that other members of this resource occur within the facility, based on an analysis of the ethnohistoric or historic land use patterns and/or a review of the landform patterning of prehistoric materials. The probability of these additional occurrences has been noted as negative (-), positive (+), or highly positive (++).

^b This is a subjective summary assessment of the overall research value (RV) of the resource class. It is an evaluation of the class' quality of preservation, representation of activity diversity or uniqueness, and temporal distinctiveness or reflection of diachronic relationships. It incorporates the need to avoid triviality, but to acquire what may be redundant data so as to discern patterns among those data. Based on these research values, the resource classes under discussion are ranked from 0 (no value) to 5 (highest value), including "NA" if such an evaluation is believed to be impossible given the available information.

^c The Confidence Rating (CR) is a further evaluation of the perceived reliability of the research (RV) or sociocultural (SCV) values of the resource class. 1 - the judgement is more guess than science, and likely not to be reliable; 2 - the judgement is moderately reliable; 3 - the judgement is most likely reliable.

^d This is a subjective summary assessment of the overall sociocultural value (SCV) of the resource class. It is an evaluation of the social, religious, or political importance of the resource to a contemporary community, from 0 (no value) to 5 (highest value).

5.2 IDEAL GOALS AND OBJECTIVES

Given the assumption that significant (and presently unidentified) archeological resources are located within the Holston AAP, the following is an outline of a desirable program to manage these resources for the best preservation or use of their research and sociocultural values. An ideal archeological resource management program would encompass identification, evaluation, conservation, excavation and analysis, and interpretation activities. It would emphasize the conservation of significant resources, and their excavation or "use" only to mitigate any unavoidable destruction or damaging activities or in search of important information that is being collected and studied within a well designed research project. Holston AAP personnel may wish to consult the Tennessee historic preservation plan (the RP3 plan) currently being developed by the Tennessee State Historic Preservation Office, to identify research questions applicable to the AAP archeological resources.

The first element in any ideal management program is the appropriate treatment of the archeological materials (including human skeletal remains) from site 40 HW 15, which is located on public lands. These were apparently retained as a private gift by the individuals who excavated them with the approval of the Holston AAP a decade ago. It is in the public interest for the U. S. Army to complete the scientific analysis of those materials, supporting professional analytical and writing services working in cooperation with the original site excavators. If human skeletal remains from site 40 HW 15 still exist in these private collections it is appropriate that they be treated in accordance with U. S. Department of the Interior (1982) guidelines. To do this, it is appropriate that the Army request that they be returned from private collections to Federal authorities for appropriate analysis and perhaps even reinterment.

The next major element in developing a management plan for the Holston AAP is the identification of the archeological resources located on the facility. Since no archeological resource surveys have occurred on the AAP, the first step is field identification of the sites predicted to be there. Such an identification program should begin with a more intensive and extensive review of oral and archival historic information. This should involve consultation with professional historians and with people with personal ties to the AAP's pre-1942 occupants. This would complement the more extensive evaluations of natural resource distributions, which have been presented within this report as the basis of evaluating the distribution and potential significance of any prehistoric archeological resources there.

The second stage of the identification program would be the field inventory of the undisturbed portions of the AAP to identify the surface evidence of any historic or prehistoric archeological sites. Such an identification project would include the pedestrian survey of the plant, with close-interval spacing of survey transects. Large-scale aerial

photographs and detailed topographic maps should be used for field reference. Standard forms for recording the surface characteristics of identified prehistoric and historic resources should be completed as part of the inventory procedures and the area and methods of the survey should be well documented. The preferred survey policy for most contemporary projects is to make only minimal collections of artifacts off of site surfaces, retaining only those that are diagnostic of particular styles and/or technologies or are immediately vulnerable to uncontrolled collection or damage. Any collected materials should be fully described and appropriately curated.

In addition to a description of the surface evidence of these sites, the ideal inventory would include some kinds of subsurface investigation (e.g., augering, test excavation, remote sensing) to evaluate the contents, extent, and integrity of the identified resources. Finally, this stage should include an identification of the important research or other values inherent in the inventoried sites, both as a basis for the development of future research designs as well as for the evaluation of management options should the resource be threatened with damage or destruction by non-archeological-research activities. For purposes of future research development, the identification and evaluation of the resources needs to be well documented and available to the research community. For future resource management purposes, it needs to be appropriately stated within the U. S. Department of the Interior's terminology and concepts of resource significance.

The prevailing professional approach to archeological resources for the past decade has been one of conservation (Lipe 1977:21)--"Our goal...is to see that archaeological resources everywhere are identified, protected, and managed for maximum longevity." Thus, the ideal objective is to develop a "bank" of significant sites that may be investigated through a variety of techniques, including destructive excavation, only as part of well designed research projects that are scheduled within a regional research program that seeks to maintain the overall range of undisturbed sites for future use. A corollary to this is that the sites should be allowed to be investigated by scientists in a non-reactive situation (i.e., not threatened with immediate destruction of the resource). Such basic investigation of resources on the public lands should be conducted only within research designs that are appropriate to the contemporary regional or broader study questions. It should also be conducted only within a program that includes long-term protection of the information collected from the resources, and a commitment to the public dissemination of that information.

If an archeological site evaluated as being of research or sociocultural significance is going to be damaged or destroyed, the ideal objective would be to preserve its included materials and information values through a "salvage" or "data recovery" program. Such a program would be little different from the non-reactive investigations discussed above, but is likely to be conducted in emergency situations with

requirements for immediate recovery. Again, an important element in such an emergency research program would be the adequate analysis, curation, and publication of the recovered information.

Thus, in summary the ideal goals for the management of the Holston AAP archeological resources are to:

- Recover any research values inherent in the materials collected from site 40 HW 15 and now held in private lands, and ensure the respectful treatment of any human remains from that site
- Inventory and evaluate all the archeological resources on the facility
- Conserve the significant sites, allowing their research use only within a regional research design
- Recover the contents and information from any significant resources threatened by damage or destruction
- Provide the public with the substance of the information values that are inherent within or collected from the arsenal's archeological resource base.

A RECOMMENDED ARCHEOLOGICAL
MANAGEMENT PLAN FOR THE HOLSTON AAP

6.1 FACILITY MASTER PLANS AND PROPOSED IMPACTS

There is no long-term planning document for the Holston AAP calling for any additional major construction activities on the Holston AAP. Continued operation of the plant essentially within existing parameters is anticipated. From the standpoint of effect on archeological resources, the primary sources of adverse impact will be: (1) excavation for fill dirt and for refuse pits; (2) continued extension of row crop leases; (3) minor construction and road relocation activities; and possibly (4) land transfer and/or acquisition. None of these planned ground-disturbing activities has been developed as a project with a specific location.

6.2 APPROPRIATE ARCHEOLOGICAL MANAGEMENT GOALS WITHIN THE HOLSTON AAP'S MASTER PLAN

6.2.1 General Facility Planning

Army Regulations 420, drafted pursuant to the National Historic Preservation Act and 36 CFR 800 (Section 1.1), require that each DARCOM installation have a Historic Preservation Plan or have documentation on file indicating that there are no installation resources appropriate to such management planning. At present, there is no such negative declaration for the Holston AAP and at least one archeological site is known to exist on the facility. Therefore, the present report is organized so as to provide a basis for such a Plan to be developed and implemented on the facility.

A review of the information provided in Section 3.0 indicates that of the AAP's 6545 acres (45 in Area A, 6500 in Area B), only 350-400 acres (including all of Area A) have been subject to total disturbance to a depth of six feet within the past 40 years. Another 250 acres are estimated to have been 50 percent disturbed to a depth of three feet, and 150 acres more to have been similarly disturbed to a depth of six feet. The agricultural lands on the facility are believed to retain the potential for containing significant archeological materials and to need survey. Thus, it appears that there are some 5700 acres of Area B of the Holston AAP that merit archeological field inventory and evaluation.

The Department of the Army AR 420 regulations prescribe Army policy procedures and responsibilities for compliance with the National Historic Preservation Act of 1966, as amended; for the maintenance of state-of-the-art standards for preservation, personnel and projects; and for accomplishment of the historic preservation program. The Historic Preservation Plan has the following objectives:

- Provision of historic and archeological data for the installation's information systems
- An outline of priorities for acquiring additional information to determine if there may be additional projects not yet located or identified
- Establishment of a procedure for the evaluation of historic properties
- Provision of guidelines for the management of historic properties
- Implementation of a legally acceptable compliance procedure with the Advisory Council for Historic Preservation (ACHP) and the State Historic Preservation Office (SHPO)
- Integration of historic preservation requirements with the planning and execution of military undertakings such as training, construction, and real property or land use decisions
- Ranking of facility projects by their potential to damage historic properties
- Identification of funding, staffing and milestones needed to implement the plan.

The identification and evaluation of historic and prehistoric resources on the AAP has been initiated by the completion of this overview and plan (as well as the identification of site 40 HW 15). This needs to be followed by a full identification and evaluation program as outlined in Section 5.2: more extensive oral and archival historic review; field surface and subsurface inventory of all undisturbed AAP lands; and evaluations of resource significance in terms of U. S. Department of the Interior criteria. Some or all of this recommended work could be postponed until there is a specific ground-disturbing project that requires compliance with the National Historic Preservation Act (see Sections 1.1, 6.2.2), if development of a historic preservation plan more specific than this document is also to be postponed and if such scheduling has been accepted by the Tennessee State Historic Preservation Office (SHPO).

Under any schedule, until the determination has been made that identified prehistoric or historic sites are not significant they must be managed as if they were, for compliance with Section 110(a)(2) of the National Historic Preservation Act:

(2) With the advice of the Secretary [of the Interior] and in cooperation with the State Historic Preservation Officer for the State involved, each Federal agency shall establish a program to locate, inventory, and nominate to the Secretary all properties under the agency's ownership or control by the agency, that appear to qualify for inclusion on the National Register in accordance with the regulations promulgated under section 101(a)(2)(A). Each Federal agency shall exercise caution to assure that any such property that might qualify for inclusion is not inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly [underlining added].

As outlined in the previous discussion of ideal archeological management goals (Section 5.2), a recommended next stage in the assessment of the importance of the facility's historic archeological resources is an intensive review of archival material and evaluation of regional historic research objectives. The archival review might focus on information stored in the National Archives and Records Service (Record Group 156, Records of the Office of the Chief of Ordnance; Record Group 338, Records of the U. S. Army Commands), as well as a more intensive review of Hawkins and Sullivan counties land records, wills, and other pertinent documents and interviews of pre-1940s residents of arsenal lands. This review and evaluation should include consultation with the Tennessee SHPO to identify and prioritize regional historic research questions to which the historic archeological information from identified sites might contribute. The goal of this research would be to define the historic significance that any of the identified sites might have if it had contextual integrity and was to be archeologically investigated.

As discussed in Section 5.2 and required by the National Historic Preservation Act (NHPA), the next step in the identification stage of archeological resource management should be field investigation to locate sites and determine their boundaries, contents, and integrity. NHPA Section 110(a)(2) requires that all federally owned or controlled lands be surveyed to identify all significant archeological properties on them. A strict adherence to this would support the immediate intensive archeological inventory of all Holston AAP lands not previously surveyed or not clearly documented as having deep and extensive modern ground disturbance (some 5500 acres). The current prevailing federal policy about the implementation of this requirement is that it should be a "reasonable" program consistent with the overall schedules, budget, and multiple objectives of the land-managing agency. Given (1) the apparently large percentage of the AAP that has not been subjected to deep ground disturbance within the past 40 years, (2) the continuing leasing program identified in Section 3.1, (3) the probability that there will be some land transfers or fill dirt excavations in the near future, and (4) the high likelihood that there are significant prehistoric and historic archeological materials on the AAP, it is recommended that it would be most cost-effective to complete the archeological inventory of a sample of the undisturbed lands on the facility as soon as it is fiscally possible.

A recommended survey program would address both the potential historic sites identified archivally, and the possible prehistoric sites whose locations are more frequently differentially distributed across the facility landforms. The 16 identified potential historic resources should be field checked. In complement, a stratified sample survey should be completed to identify prehistoric sites or evaluate their likelihood of being found with integrity on the facility. It is recommended that the survey (referred to here as Phase I) include intensive coverage of all relatively undisturbed bottomlands, terraces, and ridges (northern Area B) that might still contain intact sites; this is estimated to include some 2000 acres. The lower slopes, stream valleys, benches, and finger-ridges of Holston River and Bays Mountains (estimated to include some 3500 acres) are recommended to merit only a 5 percent sample coverage to identify site distribution on those landforms. If any of these mountain landforms are demonstrated to have sites on them, additional survey would be in order to adequately identify and evaluate the facility's resource management needs.

Phase I field reconnaissance should include some limited subsurface investigations, such as augering or shovel tests, to attempt to evaluate the integrity and depth of any identified sites. However, evaluations of site significance may require Phase II limited test excavations. The amount of work required during these tests cannot be addressed realistically until completion of Phase I, although usually the significance of a site can be determined on the basis of 3-10 days of fieldwork by a six person field crew and subsequent description, analysis, and reporting.

Based on the historic and field inventory and perhaps test data, the significance of all identified sites should be evaluated following criteria set forth in 36 CFR 60.6 and in accordance with guidelines from the Tennessee SHPO. If sites are judged to be significant, a plan for their long-term management should be developed in the context of overall property management (including the management of any identified ethnohistoric or historic architectural/engineering resources). Such management activities might include resource conservation in place, biannual field review of site condition, public interpretation of resource values, scientific investigation of the sites, and/or planned site destruction by military activities. If significant sites are identified, it is recommended that the DARCOM officer responsible for the Holston AAP (or the appropriate contract manager for the facility) provide the Tennessee SHPO with the opportunity to review and comment on the proposed management plan. If the evaluation is made that none of the sites on the AAP is significant, filing of a report to that effect with the SHPO would complete the facility's compliance requirements for preservation planning.

Under the guidance to exercise caution (Section 110(a)(2) of the National Historic Preservation Act) we recommend that the one identified prehistoric site on the Holston AAP, which has been professionally evaluated but not formally determined to be eligible for the National

Register, be managed as if it were Registered. We suggest that this management include avoidance of the site by any authorized ground-disturbing activities, and monitoring of the area to restrict its being vandalized. Further, we recommend that the scientific information recovered from site 40 HW 15 be professionally analyzed and published, and that any human remains from the site that might be retained in private hands be returned to Federal control and treated following the U. S. Department of the Interior (1983) guidelines as part of the professional study. This entire analysis and treatment program should be developed by DARCOM in consultation with the Tennessee SHPO and the Advisory Council on Historic Preservation, since the materials are from a property that is highly likely to have been or even still be eligible for the National Register of Historic Places.

The avocational archeologists within the Kingsport Chapter of the Tennessee Archaeological Society should be encouraged to provide assistance to any professional archaeological teams that work on the Holston AAP. However, the Archaeological Resources Protection Act of 1979 (Section 1.1) requires that archaeological investigations on federal lands be directed by individuals who meet the archeological and historical qualifications standards of the U. S. Secretary of the Interior.

6.2.2 Project-specific Resource Protection or Treatment Options

As outlined in Section 6.2.1, it appears that approximately 15 percent of the Holston AAP has been impacted by modern construction, and any future ground-disturbing activities in those areas are unlikely to need pre-construction review of their potential adverse impacts to significant archeological resources (the exception might be deep new excavation into previously undisturbed deposits beneath modern buildings or structures). However, new ground-disturbing construction on, or leasing of, AAP land would be a federal undertaking requiring compliance with Section 106 of the National Historic Preservation Act (see Section 1.1 of this report). Section 106 requires that DARCOM consult with the Tennessee SHPO and the federal Advisory Council on Historic Preservation about the effects of such an undertaking on significant archeological sites. Without a SHPO-accepted facility preservation plan, it is DARCOM's responsibility to either complete such an evaluation and consultation program for each new undertaking or to have on file documentation of the completion of adequate survey and evaluation so as to confirm the absence of or lack of significance of any archeological site that might be affected by the proposed activity.

Federal laws and regulations require that federal land-managing agencies financially support any archeological excavation conducted to mitigate the adverse impacts of federal construction on their lands. In addition, the individuals completing such work must meet the qualifications standards of the U. S. Secretary of the Interior. Since the portions of the AAP that are relatively undisturbed (estimated to include 85% of the area) have not been subjected to intensive archeological survey, construction or ground-disturbance in areas

currently unsurveyed could impact archeological resources. Consequently, if such impacts were planned, survey, evaluation, and perhaps required mitigative data recovery (scientific archeological investigation of a significant site) could be necessary on a project-specific basis prior to initiating the ground-disturbing activity. Such evaluation and preservation programs require consultation with several federal agencies, and are frequently time-consuming and have the potential for causing construction delays. However, such a project-specific program can usually be expedited if the appropriate preservation planning has been completed and reviewed by the State Historic Preservation Officer.

If it is found during the planning stage of a project that an archeological resource is endangered, several options exist. First, it is sometimes possible to relocate the project slightly to avoid damaging the site. This is frequently possible in the case of borrow and refuse pit excavations and some minor construction projects. From a resource protection standpoint, this may be the best resolution of potential threats to the archeological data base. However, it may not be feasible for other reasons. The alternative is to evaluate and treat the archeological resource as outlined in Section 6.2.1 above. This is most easily done when the evaluation of resource significance and appropriate treatment can be made within the context of a facility Historic Preservation Plan.

6.2.3 A Summary of Recommended Management Directions and Priorities for Effective Compliance and Program Development

Based on the fact that a significant prehistoric archeological site is known to have existed (and may remain in part) on the facility, and that there is a large amount of relatively undisturbed AAP acreage that probably retains other prehistoric or historic sites, Section 6.2 has outlined some short- and long-term management directions for the Holston AAP. These include, in order of their recommended priority from first to last:

- Consultation with the Tennessee SHPO about this set of recommendations, and agreement as to a scheduled compliance program for the AAP
- Professional analysis of the material from, and possible remnants of, site 40 HW 15
- Professional inventory and evaluation of the prehistoric and historic archeological resources that may remain in the relatively undisturbed 5500 acres of the facility
- Integration of historic architectural and archeological data and management needs into a facility Historic Preservation Plan, if the previous activities indicate that there are resources on the AAP requiring long-term management.

6.3 ESTIMATED SCOPE OF WORK AND COST LEVELS FOR PRESENTLY IDENTIFIABLE MANAGEMENT NEEDS

This section provides a scope of work and milestones for two recommended short-term archeological management activities: Phase I inventory and preliminary evaluation of archeological resources on a sample of AAP lands, and concurrent treatment and evaluation of the material from and remains of site 40 HW 15. These recommendations are based on the assumption that their implementation will be preceded by consultation between DARCOM and the Tennessee SHPO.

6.3.1 Phase I Inventory and Evaluation.

Phase I operations are essentially locational in nature, although additional data regarding time of location, function, and general significance of historic resources should also be obtained as an archival and/or oral historical component of the inventory. A stratified sample survey such as described in Section 6.2.1 would cover approximately 2500 acres, 2000 of which would be an intensive review of undisturbed bottomlands and terraces and 500 of which would be sample tracts or transects in the areas less likely to retain archeological materials. In addition, the 16 potential historical resources identified in Section 4.0 merit field review.

Such survey should be preceded by a more intensive archival and oral historical review project, which is estimated to require 20 work days. The archeological field inventory should be conducted by archeological professionals who meet the qualifications and performance guidelines of the U. S. Department of the Interior (1983) and hold a federal antiquities permit. The conduct of the inventory should generally involve survey at close intervals, augering or shovel tests at selected locations, recording of cultural resource information on SHPO-acceptable inventory forms, and collection of only diagnostic items or items in danger of immediate loss. All archeological resources should be mapped so as to have their likely boundaries well defined, and their subsurface depth and integrity should be ascertained at first review as much as is possible. Each identified resource should be evaluated for its research and sociocultural significance, and recommendations should be made concerning its eligibility for the National Register and its appropriate management.

At a rate of 75 acres per work-day (assuming 5 sites per square mile and time spent with shovel testing and moving among sample parcels), field operations are estimated to require at least 34 work-days to survey 2500 acres. If a higher density of cultural resources is encountered, additional field time may be required. The assumption does not include extensive subsurface investigations or investigation of site 40 HW 15. Field review of the identified potential historic resources is recommended to require an additional 10 work-days. Analysis of recorded information, preparation of site forms, and the completion of the final report will take approximately 88 work-days. This is a total estimated archival and field effort of 152 work-days, or 1216 work-hours.

Costs of this technical field review and evaluation program, including all necessary travel (using local expertise), reference telecommunications, data management, and report preparation costs (but no general and administrative or departmental costs or fee or profit) generally average between \$20 and \$25 per work-hour across the country. Because of relatively greater use of senior expertise, archival programs (with similar assumptions) average between \$25 and \$30 per work-hour. These rates are unloaded base costs, with no fee, general and administrative cost included within the estimate that is presented in FY84 dollars. Thus, given the potential cost of field activities, laboratory and special analyses costs, and the costs of report preparation, the unloaded cost of this optional management recommendation is between \$25,120 and \$31,200 in 1984 dollars. This cost is assumed to cover only routine involvement of the consultant with any state or federal review process.

The milestones for the recommended work would be, in sequence:

- Completion of Part A, a brief preliminary draft report on the archival and oral historic research documenting the potential relative importance of the potential historic archeological resources that might remain on the AAP
- Completion of the archeological inventory and preliminary evaluation of identified archeological resources (excluding 40 HW 15); completion of additional subsurface investigation of selected sites if necessary to support the evaluations
- Completion of Part B, a preliminary draft report on the field investigations and recommended evaluations and management program, for DARCOM review
- Completion of DARCOM review of the preliminary draft Parts A and B, as documented by a letter accepting them as appropriate for interagency consultation
- Completion of consultation (including both DARCOM representatives and the historical/archeological consultants) with the Tennessee SHPO about the evaluations and recommended management, as documented in a letter of concurrence from the SHPO
- Completion of review of the DARCOM-submitted evaluations by the U. S. Department of the Interior's Keeper of the National Register, as documented in a letter of concurrence from the Keeper.

6.3.2 Evaluation of Site 40 HW 15

As was discussed in Section 4.0, site 40 HW 15 is a prehistoric Woodland site on the Holston AAP that was originally several acres in extent and was partially salvaged in the 1970s by members of the

Kingsport Chapter of the Tennessee Archeological Society. That data recovery program has never been completed, and we recommend that it should be completed by DARCOM. It is impossible to provide a valid or reliable estimate of time or costs needed to complete this program at this time. At present we have no clear idea of the number of artifacts still held in private hands; the quality of the field records describing the materials, field methods, or site context; or the amount of the site that remains intact. We do know that human burials were found (but not necessarily removed) from the site. Thus, we recommend that DARCOM exercise particular care in seeing if burials are still available and, if so, assuring that they are treated according to the guidelines of the U. S. Department of the Interior (1982).

Three major steps must be taken to evaluate site 40 HW 15. First, there must be a field review of the site, involving test excavations to evaluate the integrity and extent of the remains cultural deposits. Second, and concurrently, available material from the amateur excavations must be located, documented, measured, and photographed. All available field notes must be copied. Third, material from both the field review and amateur collections must be analyzed, interpreted, and written up. A recommendation regarding the site's eligibility for nomination to the National Register of Historic Places must be documented. This information should be incorporated into, or appended to, the facility's overall inventory and evaluation described in the preceding section.

As a round estimate, we can suggest that the first two steps (field review and collections study) will require approximately 80 work-days. Step three (analysis and reporting) is likely to require an additional 160 days. At a base cost of \$20 to \$25 per work hour, as described in the previous section, this would range from \$38,000 to \$48,000 in unloaded FY84 dollars. These estimates are made assuming that if the collections are too large and/or too dispersed to permit this, senior staff will have to remain in the Kingsport area to complete this study at additional cost.

The milestones for this recommended recovery program would be, in sequence:

- Consultation with the Tennessee SHPO about the site and its recovery needs, and perhaps use of the SHPO to facilitate discussions with the Tennessee Archeological Society about completing this analysis program and assuring the appropriate disposition of the site materials (especially any human skeletal remains)
- Professional archeological description and analysis of the collected artifacts, ecofacts, skeletal materials, and site context (insofar as the latter can be derived from field records), reported as thoroughly as possible following professional standards

- As a subset of the recommended description and analysis effort, professional physical anthropological analysis of any human skeletal materials and development of a plan for their long-term treatment; this may involve consultation with the Tennessee SHPO, and perhaps with the U. S. Department of the Interior's Departmental Consulting Archeologist to facilitate any interactions with concerned Native Americans
- Field review, and possible test excavations, of site 40 HW 15 to determine its present integrity and scientific value, and the likelihood that additional human burials are located at the site; evaluation of the site's eligibility for the National Register of Historic Places
- Completion of DARCOM review of the laboratory and field reports and recommendations, as documented by a letter to the professional archeologists who completed the work accepting them as appropriate for interagency consultation
- Completion of consultation (including both DARCOM representatives and the historical/archeological/anthropological consultants) with the Tennessee SHPO about the evaluations of site 40 HW 15 and recommended management needs, as documented in a letter of concurrence from the SHPO
- If site 40 HW 15 is recommended as still being eligible for the National Register, completion of review of the DARCOM-submitted evaluations by the U. S. Department of the Interior's Keeper of the National Register as documented in a letter of concurrence from the Keeper; if recommended to be ineligible, no action.

SUMMARY

The Holston Army Ammunition Plant, slightly more than 6000 acres in extent, is located on the Holston River in northeast Tennessee in and near the city of Kingsport. It is in a region of considerable prehistoric and historic archeological interest. Only one archeological site is known to exist on the facility (site 40 HW 15), and this was partially excavated in the 1970s by members of the Kingsport Chapter of the Tennessee Archaeological Society. This site was a large Woodland occupation locale several acres in extent, with human burials, and is believed to be 50 percent intact today. The materials recovered from the early excavations have never been analyzed nor has any of the work been reported in the literature. Other prehistoric sites are known by local amateur archeologists to exist on the Holston AAP, and there is documentary indication that historic resources may remain there as well.

Evaluation of the plant's immediate archeological needs have been based on a tour of the facility, discussions with key personnel, and a study of the regional landforms and cultural sequence in order to assess the plant's potential archeological resource base. There is every reason to believe that such a resource base exists and that it may possess unusual integrity because of plant security, but that it is currently endangered by excavation of borrow and refuse pits, bottomland agricultural (row crop) leases, and minor construction activities. No long-term planning document scheduling future construction, leasing, or other ground-disturbing activities exists at the facility.

Given the known and potential archeological resource base probably retained on the Holston AAP, and the federal requirements for historic preservation planning and resource protection, recommendations have been provided for both short- and long-term archeological resource management on the facility. In light of the long-term needs, a program for the stratified survey of the relatively undisturbed portions of the facility has been recommended, with a scope of work, milestones, and recommended unloaded baseline cost in FY84 dollars (\$25,120 to \$31,210). In addition, the uncosted recommendation has been made that DARCOM immediately initiate consultation with the Tennessee State Historic Preservation Officer about the Holston AAP's cultural resource management needs, and that they direct their efforts toward the eventual integration of architectural and archeological information in a facility Historic Preservation Plan.

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An immediate concern is the lack of available information about site 40 HW 15, and the need for appropriate treatment of the human skeletal remains that were recovered from that site. Thus, a second management recommendation in this report is that DARCOM support the professional description, analysis, and reporting of the 1970s-derived material and information from this site; and arrange for the appropriate disposition of any of its human remains that may still exist. Further, it is recommended that site 40 HW 15 immediately be field-evaluated to determine its eligibility for the National Register of Historic Places and its immediate or long-term management needs. The cost of the analysis of the 1970s material from the site is suggested to cost between \$38,400 and \$48,000 in unloaded FY84 dollars.

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APPENDIX
RESOURCE LOCATIONAL DATA

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Table A-1. LOCATIONAL DATA, KNOWN AND POTENTIAL ARCHEOLOGICAL RESOURCES ON THE HOLSTON AAP

Site Number	UTM ^a		Ref.	USGS Quad Map ^b	CR ^c
	Northing	Easting			
<u>Known Resources</u>					
40 HW 15	4043515	355330	MSU	KPTN	3
<u>Potential Resources^d</u>					
H-1	4043165	349535	MSU	CHTN	3
H-2	4042855	350020	MSU	CHTN	3
H-3	4042770	350650	MSU	CHTN	3
H-4	4042680	350780	MSU	CHTN	3
H-5	4043470	350410	MSU	CHTN	3
H-6	4043170	351000	MSU	CHTN	3
H-7	4042935	351145	MSU	CHTN	3
H-8	4042595	351060	MSU	CHTN	3
H-9	4041980	351140	MSU	CHTN	3
H-10	4042535	352080	MSU	CHTN	3
H-11	4042650	352630	MSU	CHTN	3
H-12	4044970	354760	MSU	KPTN	3
H-13	4044910	354790	MSU	KPTN	3
H-14	[not mapped]		MSU	unknown	1
H-15	See Figure A-2		MSU	CHTN	3

^a Universal Transverse Mercator (UTM) Zone 17; locational data provided by Memphis State University (MSU).

^b CHTN = Church Hill, TN-VA, 7.5 min. quad (1959, photorevised 1973); KPTN = Kingsport, TN-VA, 7.5 min. quad (1959, photo-revised 1968 and 1978).

^c The Confidence Rating (CR) is an evaluation of the perceived reliability of the site locational data. 1 = the information is more guess than science; 2 = the judgement is moderately reliable; 3 = the information is most likely reliable.

^d These resources are described in Table 4-1, and mapped on Figures A-2 and A-3.

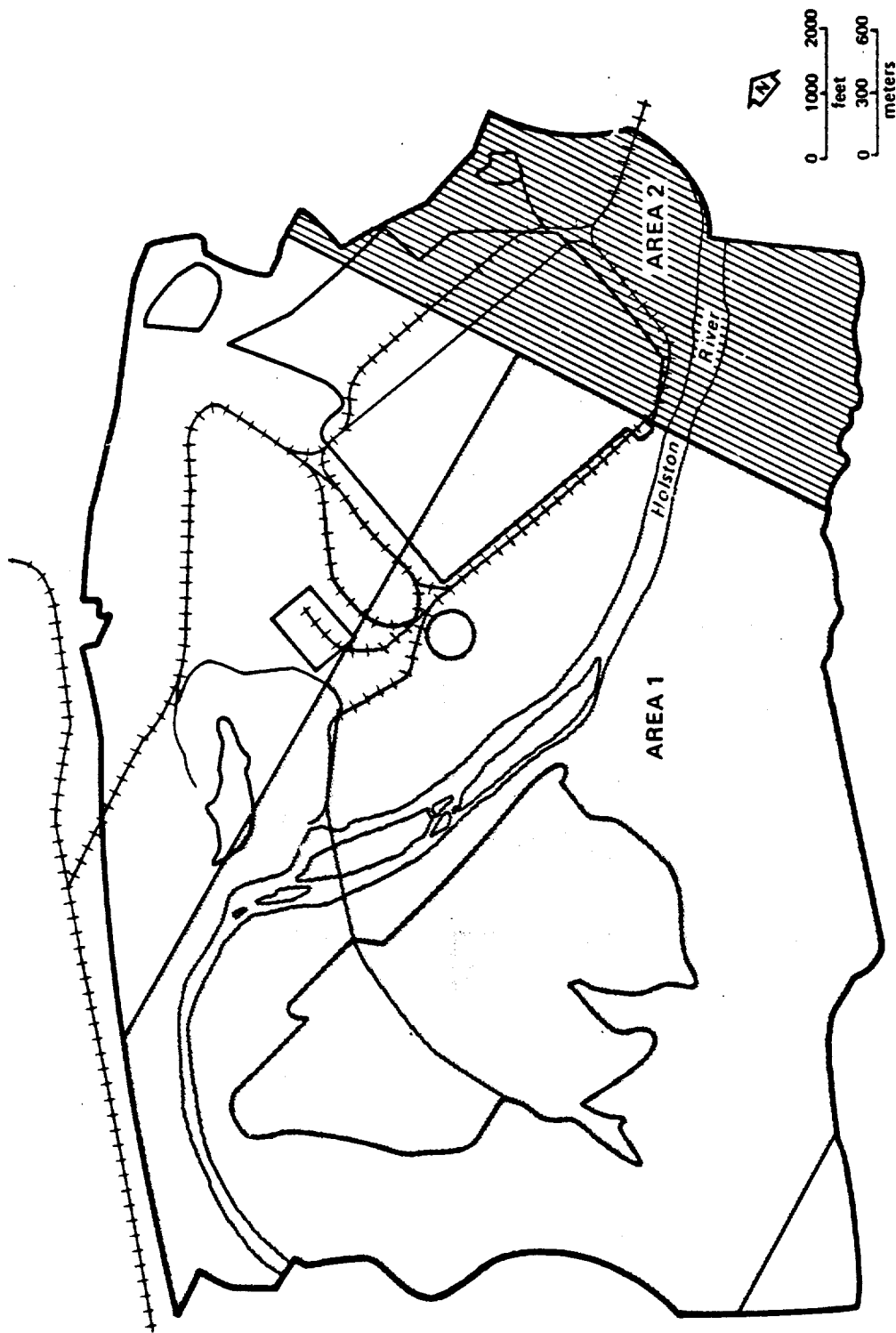


Figure A-1. LOCATION OF MAPPING AREAS DEPICTED IN FIGURES A-2 AND A-3, HOLSTON AAP, AREA B

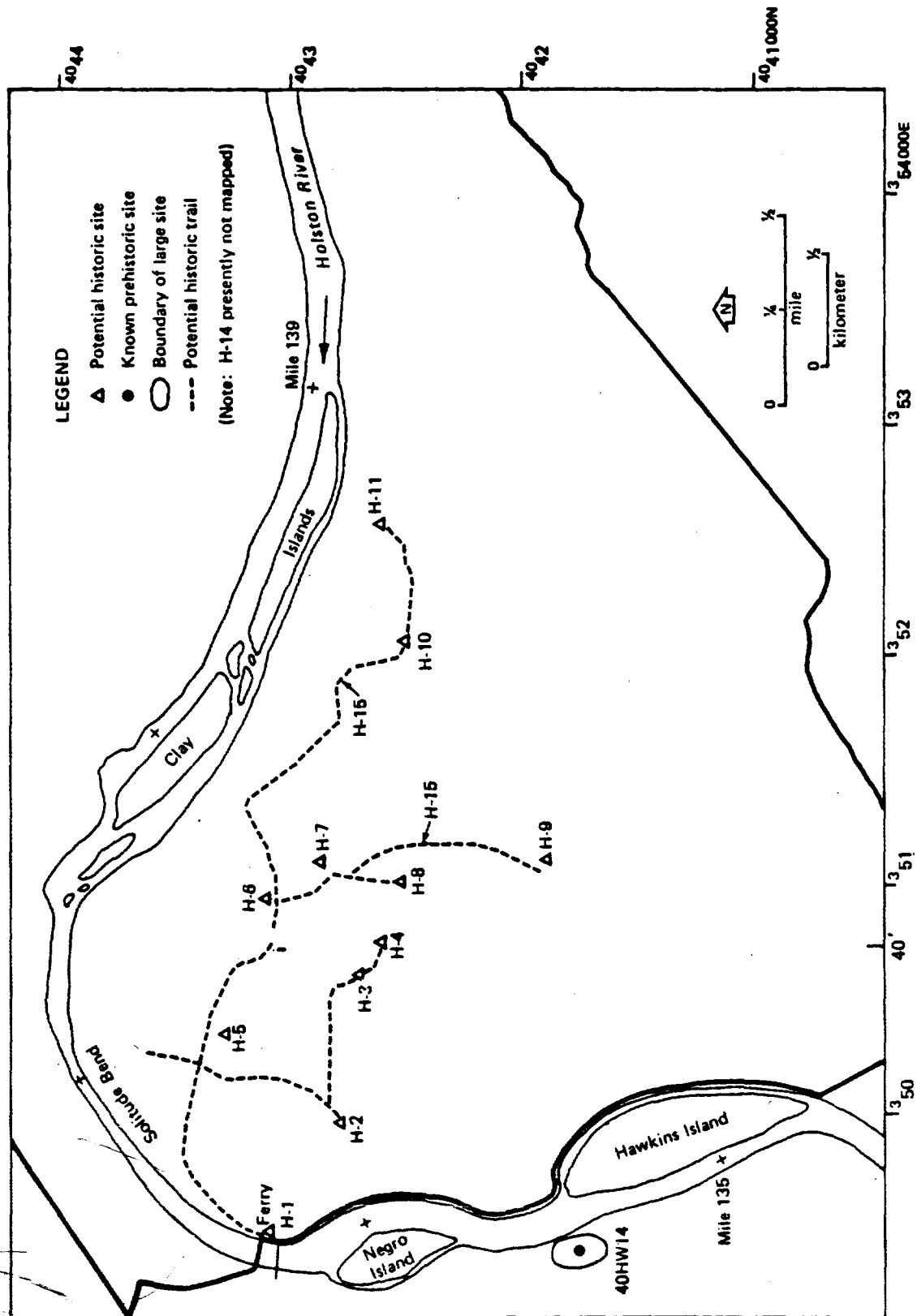


Figure A-2. KNOWN AND POTENTIAL ARCHEOLOGICAL RESOURCES ON THE HOLSTON AAP, AREA 1

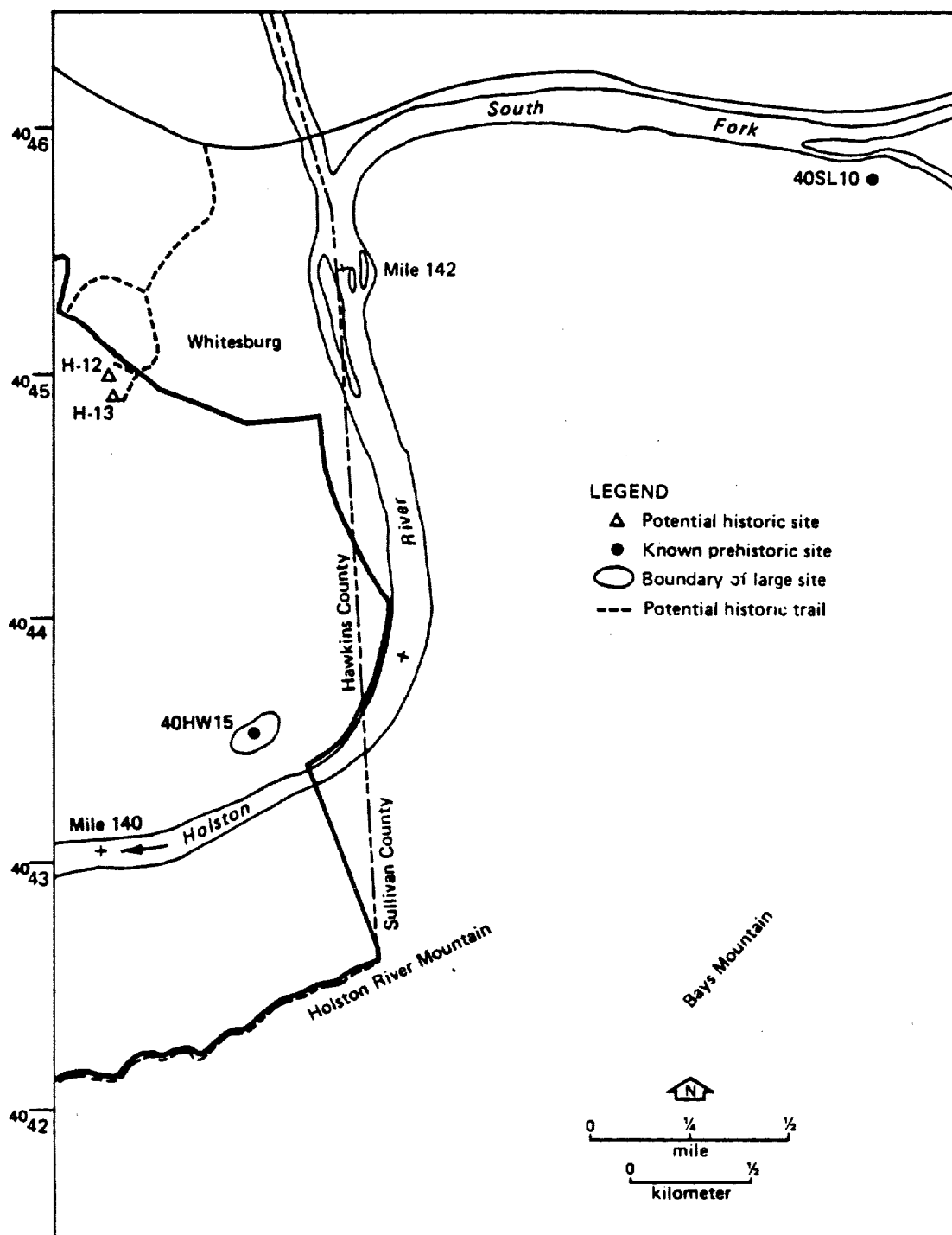


Figure A-3. KNOWN AND POTENTIAL ARCHEOLOGICAL RESOURCES ON THE HOLSTON AAP, AREA 2